The Executive's Guide to Mastering the Web in Business

# WEBMASTER

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May 1997

# Procurative Powers

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*Unisys Corp.'s director of financial planning for global procurement, Chuck Stemler*

**ALSO INSIDE:**

**Can you outsource your way to Web excellence?** *Page 26*

**Can you mix internal and external Web efforts?** *Page 34*

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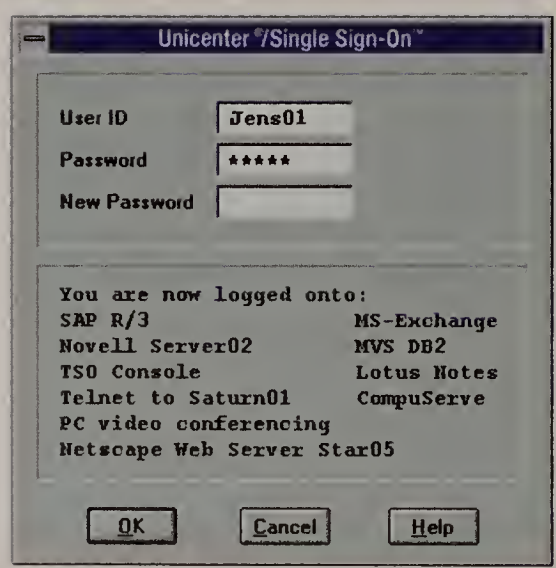


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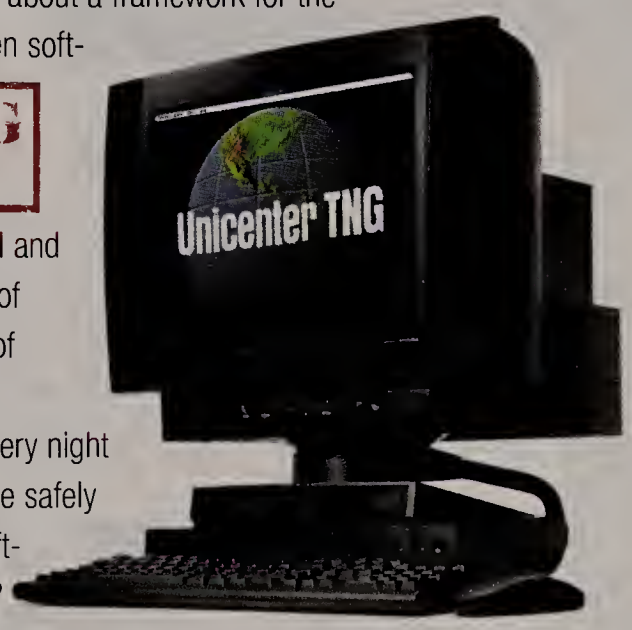


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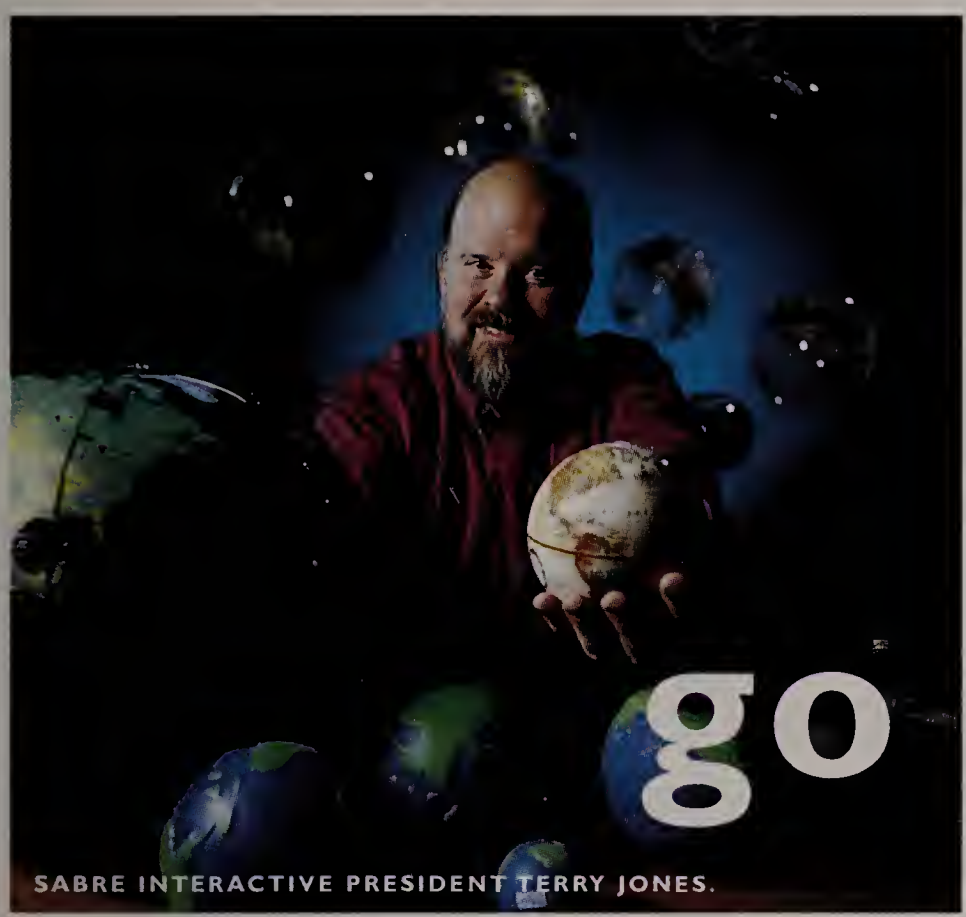


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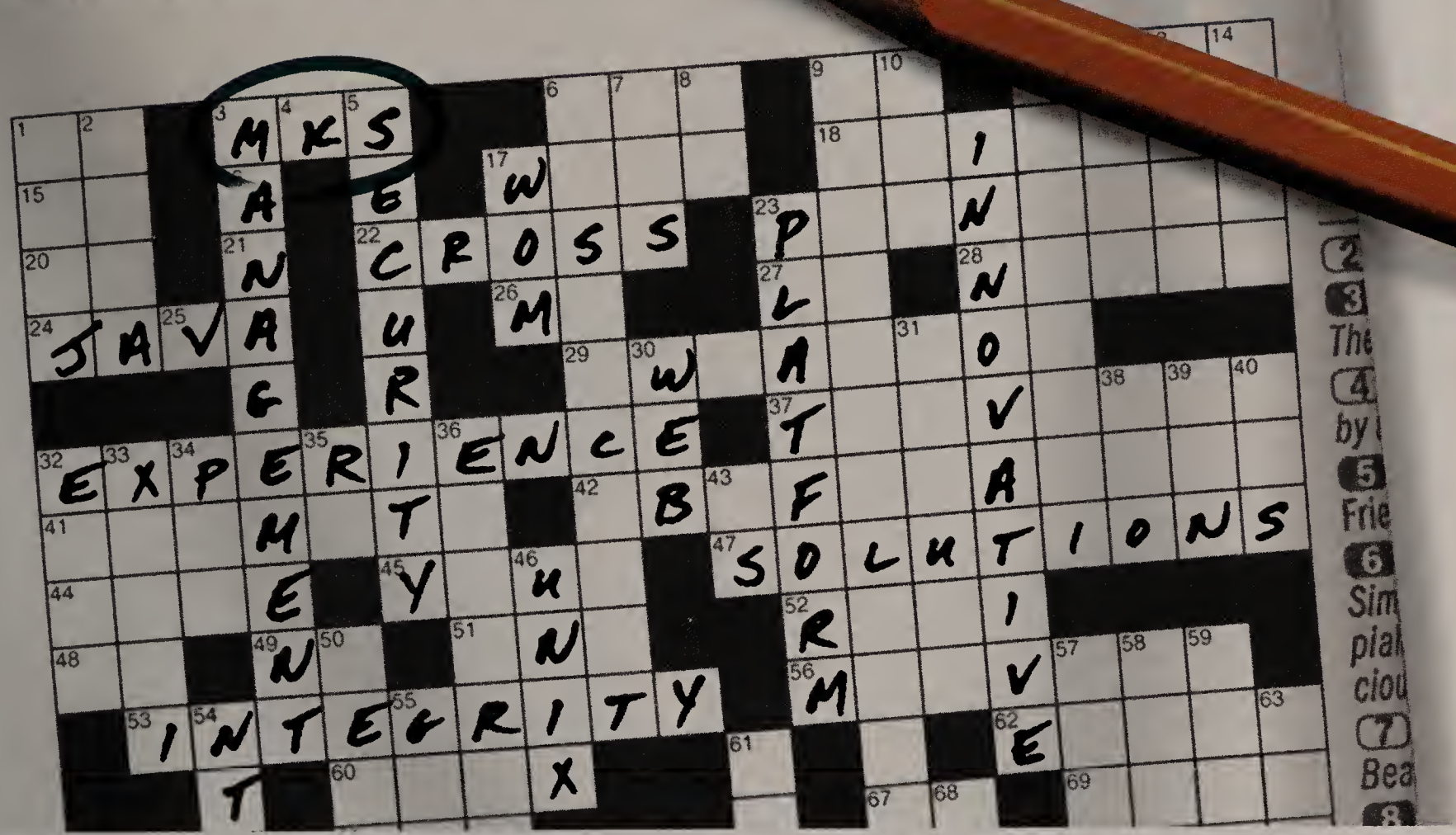


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# Push Push

A FEW YEARS AGO, self-proclaimed Internet visionaries would rhapsodize about the dawning of an age in which lucky info-consumers would have, at their fingertips, a "knowledge resource" as vast as the Library of Congress. Now, of course, the aggregated Web makes the Library of Congress look positively puny. Yet, as far as I can tell, very few of us have been made a whole lot smarter by this embarrassment of alleged riches.

Still, it does shimmer attractively and hold out the promise of a great deal of genuine benefit. In thousands of enterprises, businesspeople sail upon this sea of information, trawling for something of value. And if time is money, a lot of money is now invested in such voyages, even though the catch is often questionable—with the ratio of empty water to useful harvest too high to be justified casually.

So if the availability of oodles of information doesn't make us any smarter (or at least help us make better decisions), what good is it? That question lies at the heart of the reason why so-called push technologies are hot. The push for push not only makes sense, it's like the drowning-in-data Timmy sending Lassie to get help ("Good girl!").

First, of course, there is the question of information quality. As a *60 Minutes* segment in March neatly illustrated, an unknown percentage of the folks now publishing on the Web apply the principles of fiction writing to preparing material they pass off as fact. Vetting the pedigree and likely accuracy of information sources is a daunting task. Which is why businesses increasingly are interested in strategies for controlling and screening the flow of information through their pipes.

There is also a bandwidth-based argument for push, one that was advanced recently by technology pundit Bob Metcalfe, vice president of technology for *WebMaster*'s parent company, International Data Group. Metcalfe, you'll recall, last year caused a large stir—and moderate levels of panic and skeptical sang-froid—by predicting escalatingly calamitous collapses of the Net infrastructure. He describes push technology as "a response to the increasing unreliability of Internet performance characteristics." Calling it "caching plus personalization," Metcalfe sees push as one way to conserve the overextended resources of the wider Internet and enterprise bandwidth.

If the Web is to become a powerful enabler of enterprise knowledge management, tools must be developed that make it easier to discern items of relatively higher value and to share the results appropriately. Push technologies must achieve the capability of "learning" over time what quality means to users—that is, which types and what sources of information are most useful and successful. Good push tools will refine an increasingly sophisticated profile of what constitutes high value, from the point of view of the user's needs. Or, to extend the fishing metaphor, push tools must "teach" the tastiest examples of the right species of fish to swim toward the boats that can best exploit them.

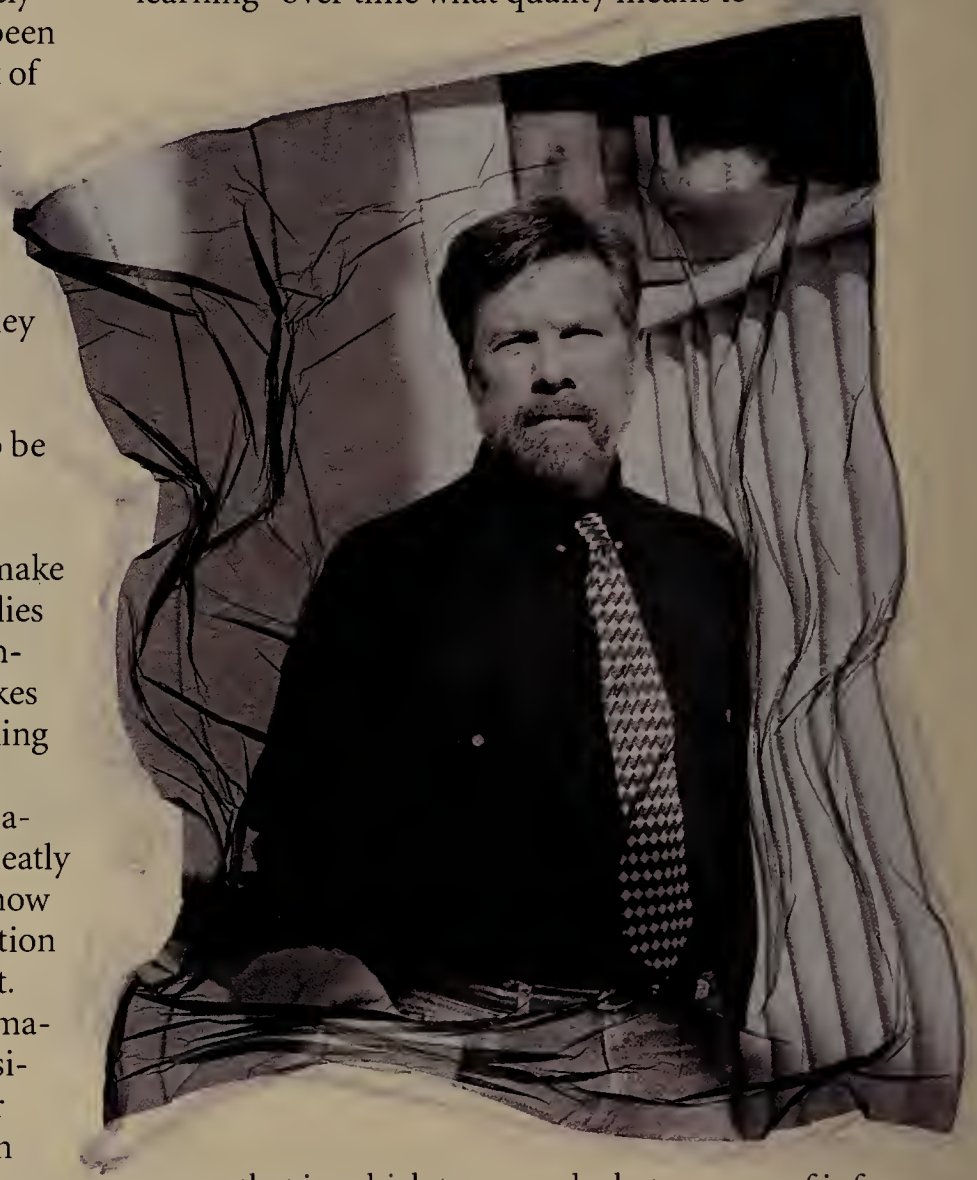


PHOTO BY JERRY MARGOLYCZ

Another fundamental need—once the means exist to distinguish high-quality information from dross—is some mechanism for sharing the wealth across the organization. When somebody in, say, product devel-

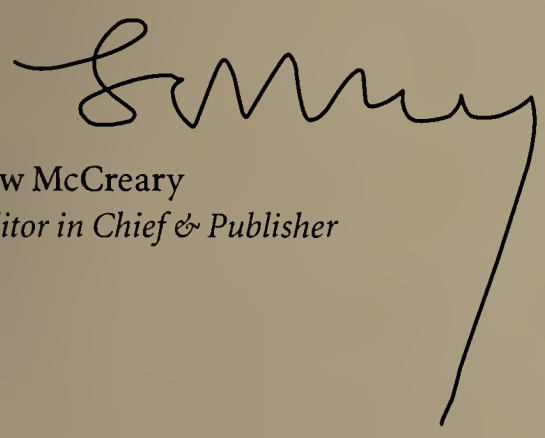
opment is pushed a competitive intelligence report on a Singaporean manufacturer of DRAM chips and the report includes a couple of paragraphs on the DRAM vendor's cash-management strategies, how can that information be shared with the appropriate people in the finance function? In other words, can push tools be engineered to forward information that may be beside the point to its direct recipients but highly pertinent to someone else?

And here's a related point: What if certain people in your organization are especially skilled profilers of their own information needs? Is there a way to identify and index exemplary profiles that might be exploitable by others with comparable needs? In a similar vein, what should enterprises be doing now to prepare themselves and their employees for the arrival of ever-more sophisticated push technologies? Are there infrastructural and training issues that need to be resolved before an effective knowledge management strategy can be deployed? Will cultures accustomed to "pulling" be comfortable with push?

Many of those issues are information age-old challenges. The Web didn't create them; at most, it only accelerated and intensified them—while presenting the potential for breakthrough solutions in knowledge management. Nevertheless, they constitute a pressing issue for business organizations, now that the flood tide of the Internet can either improve or imperil enterprise productivity and information quality.

Fortunately, the beauty of the high enthusiasm for push right now is that many technology innovators (Astound, BackWeb Technologies, Intermind, Marimba, PointCast and Wayfarer Communications, to name a handful) are gathered around the problem. And they—like their would-be customers—are intoxicated by a very large opportunity. The fulfillment of that opportunity may or may not be exactly imminent—even in human years—but we eventually will be made a whole lot smarter by it.

Who's pushing push where you work? Let us know: *mccreary@cio.com.*



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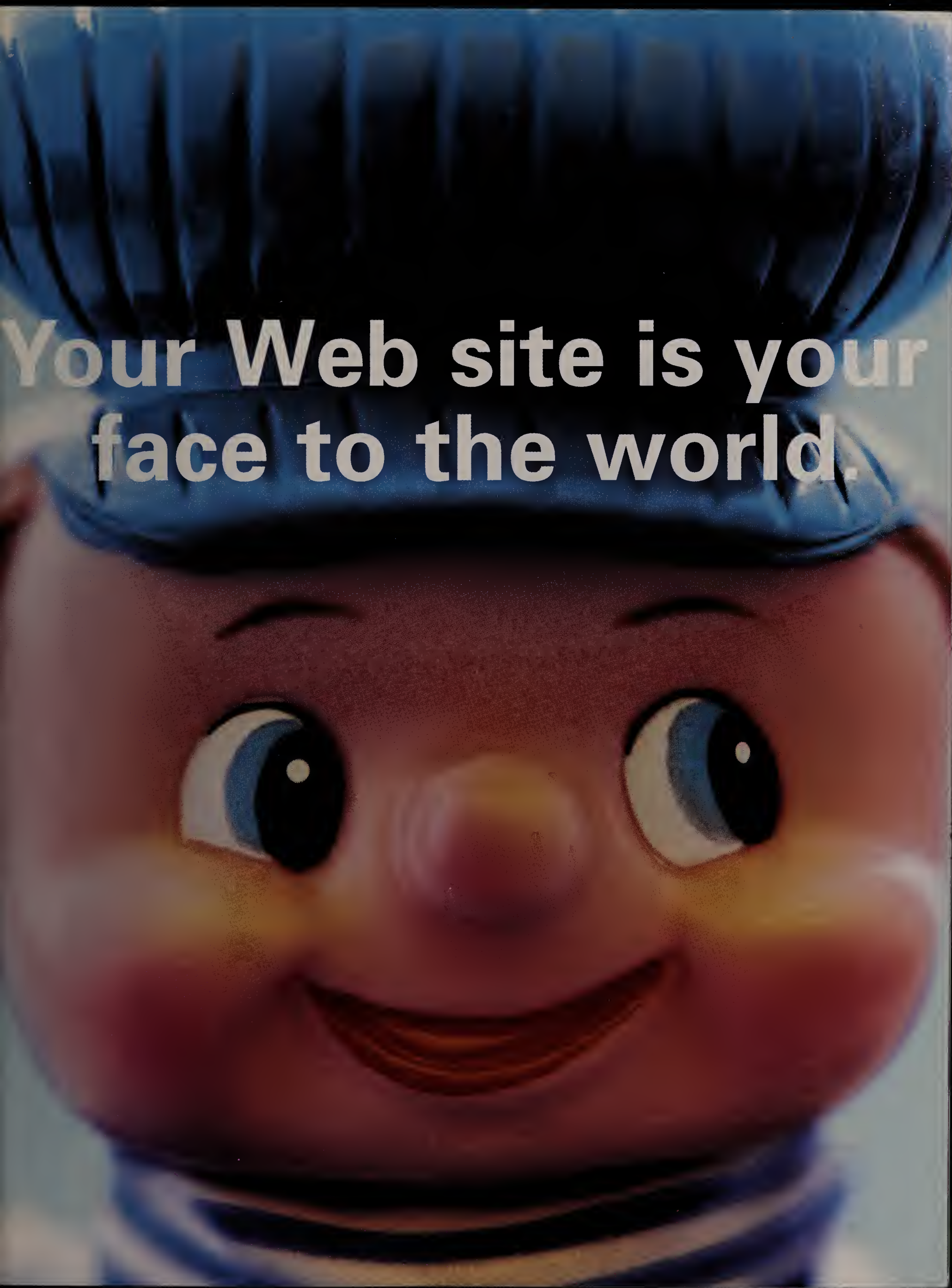
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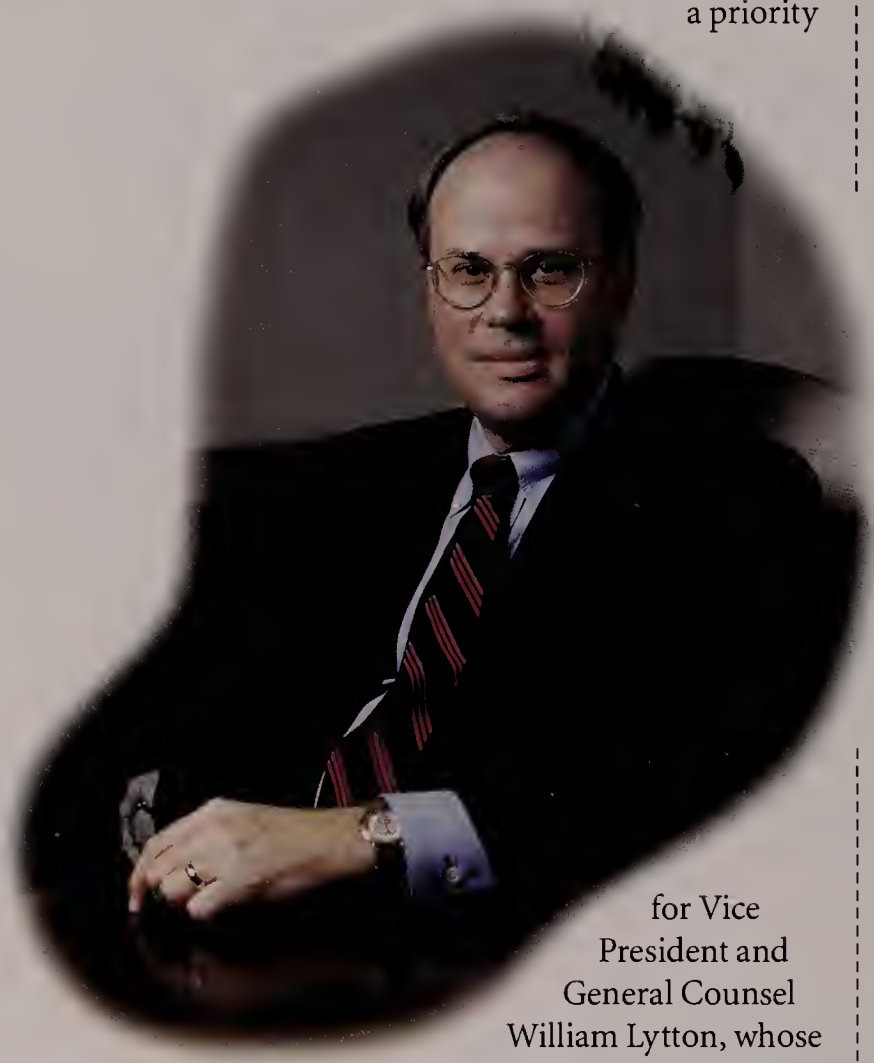
PROFILE

# Brief Encounters

CREATING A PAPERLESS office may seem an odd goal for International Paper Corp. (*www.ipaper.com*), the world's largest manufacturer of forest products. But it is a priority for Vice President and General Counsel William Lytton, whose legal department rolled out the company's first intranet last month.



**LEGAL AID:** William Lytton, general counsel of International Paper, is building an intranet to get "the 30,000-foot view"

The system, which is built on Corprasoft Inc.'s Chief Legal Officer software for intranets (Lytton's department has been using a client/server version of the product for more than a year) is only in beta. So far, most of the applications aim to help Lytton and the 40-plus lawyers in his worldwide group access information customized for their needs. "What I'm looking for is gross data that I can pull together—the 30,000-foot view," Lytton says. "But an attorney will want to stay up to date on filing a motion of discovery, settlement discussion, witness preparation—a greater level of detail."

Lytton says that he expects the intranet's heftiest payoff to come from improved communication with outside law firms. "I love FedEx, but I'd love to put them out of business as far as sending legal briefs is concerned," he says.

In any given year, International Paper may have 300 law firms worldwide working on thousands of matters. The plan is to let those companies dial into the legal department's intranet and, using a password, retrieve whatever content is relevant to them—and nothing else.

For example, outside lawyers will be able to query the system for existing briefs, "so if an issue has come up in another case, they can use [that brief], and I won't have to pay twice," Lytton says. He'll also be able to stop mailing out requests for proposals. "Now if I want bids on a case or a series of cases, I'll just alert them that I've got a proposal on the intranet," Lytton says.

The intranet will also allow International Paper to require task-based billing, which gives corporate

## Household Patterns

**37 percent of American households have a personal computer. Of those, 46 percent are online.**

**In 29 percent of households, an adult female is the main online user, up from 21 percent.**

**Americans spend 9.4 hours a week online.**

*–From the semiannual Homefront survey of 2,500 American consumers conducted by Odyssey market research firm in January 1997*

# A Happy Return

**1-800-Batteries, a distributor of batteries for laptop computers, cellular phones and other must-haves for the mobile office, saves 10 percent on the cost of administering sales made through its Web site (*www.powerexpress.com*). President Ken Hawk is so pleased with that ROI—and anxious to save even more—that he is offering customers the incentive of a $2 discount on every purchase made through the Web.**

PHOTO BY RANDY MASSER; ILLUSTRATIONS BY OCTAVIO DIAZ

lawyers more meaningful information than the traditional "For services rendered: $3 million." "Task-based billing breaks the case into its component parts: drafting a complaint, drafting an answer, written discovery, deposition, trial preparation, etc.," Lytton says. A cost is then assigned to each component, "so that if Mary and Steve and Sam and Linda all worked on the same thing and charged me $150,000 for a simple summary judgment motion, I'm going to know about it."

International Paper could require task-based billing without an intranet, but it would mean sending each law firm proprietary software containing its forms and then conducting the actual transmission of information via EDI. The plan now, according to Lytton, is to post detailed forms on the internal site and ask outside counsel simply to fill in the blanks. Naturally, this method of communication requires that companies doing business with International Paper have access to the Internet. But Lytton doesn't consider that a problem. "I think most law firms are already on," he says. And even if they're not, "we're a pretty big client. If I tell them to get on, they'll get on."

*–Leigh Buchanan*

## Trading Places

THE WAY Daniel Aegerter sees it, about half of all economic activity involves linking buyers and sellers, "whether that's on the car lot or at the stock exchange or at the grocery store." In the future, the bulk of such matchmaking will take place in electronic marketplaces, predicts Aegerter, CEO of Trade'ex Electronic Commerce Systems Inc. (*www.tradeex.com*).

That theory underlies Market Maker, the Trade'ex software with which organizations can operate live wholesale marketplaces over the Internet. And in Australia, among other places, concept has already become reality.

Market Maker works by bringing buyers and sellers onto a virtual trading floor, where they can display products, make offers, negotiate, place orders, track order status, offer promotions and change prices. For sellers, the system opens up new markets, possibly even global ones. For buyers, it offers a quick, simple way to find the best value or lowest prices anywhere at any time.

The Australian Chamber of Manufacturers, one of the country's biggest trade associations, was seeking that functionality for a pilot project to allow companies from Down Under to conduct electronic commerce with one another, the government and the world. Launched in September 1996, the project had signed up more than 2,000 companies by year's end, including members of the information technology, telecommunications, office equipment, stationery, medical products, and paper and printing industries.

In addition to helping small- to medium-size participants do business with the Australian government, the initiative helps potential trading partners of all sizes pick one another out of the crowd. "A large organization can find new, smaller customers" it might never have noticed otherwise, Aegerter says. "It can also introduce two smaller organizations who may not even know each other."

*–Anne Stuart*

### Age and the Page

**Average age of subscribers to the print edition of The Wall Street Journal: 52**

**Average age of subscribers to the online edition of The Wall Street Journal: 40**

SOURCE: *Dow Jones & Co. Inc.*

# Grrl Talk

When Aliza Sherman first ventured onto the Web, search engines swallowed the word "girl" and returned links that reflected the predominant view of women on the Net—mostly undressed. Today, Sherman is combating that stereotype with her Cybergrrl Webstation (*www.cybergrrl.com*), the hub for a cluster of female-friendly sites.

A women-helping-women mind-set permeates Cybergrrl Webstation and its spinoffs, Femina (*www.femina.com*) and Webgrrls (*www.webgrrls.com*). Femina points visitors to sites for, by and about women; Webgrrls supports Sherman's networking group for women in new media.

Sherman, who owns a thriving new-media studio, writes and speaks widely about women on the Web. She spoke with *WebMaster* from Cybergrrl's New York headquarters.

**WebMaster:** Where are all these women working in cyberspace coming from?

**AS:** Women, particularly in publishing, are finding their niches at content-oriented Web sites, even without a working knowledge of HTML. And more and more young women are learning the technical stuff by taking classes universities offer.

**WM:** How can you tell, looking at a Web site, that there are women behind the scenes?

**AS:** I find [that] sites designed by or overseen by women have a cleaner sensibility. "Guy" sites tend to be heavier with graphics, GIF animations, Shockwave.

**WM:** How can businesses benefit from women creating corporate Web sites?

**AS:** The world can benefit. [Women] tend to operate in a less classically business fashion. I think there's more of a community within a company that's driven from a feminine point of view. Think of communication, nurturing, caring, connection. Companies, especially young ones, are embracing this connectedness.

**WM:** The Web is forcing departments that traditionally had little in common—IS and marketing—to work together. Is there a role for women in smoothing this transition?

**AS:** IS itself is no longer the "men in suits" stereotype. It's kids in jeans and, more and more, young women. [But] the big companies still have the "men in suits" stereotype going on. And yes, I think women are bridging the gap there in terms of communication.

**WM:** How can companies recruit and retain talented women for jobs in cyberspace?

**AS:** Take a proactive role. Support [their] efforts to get into schools, provide resources for young women, send powerful women in corporations who are role models to speak to young women, help women who are looking to make career changes. If companies aren't equipped to mount programs themselves, there are fantastic organizations they can support: Women in Technology International (*www.witi.com*), the Association for Women in Computing (*www.awchq.org/awc/*)—and Webgrrls.

*–Hallie Ephron Touger*

## Company Lines

**Percentage of publicly traded corporations that have Web sites: 79**

**Percentage of those Web sites that post the corporation's full annual reports: 54**

Source: *Straightline Internet Communications Survey, 1997. Based on a Straightline International survey of corporate communications and investor relations professionals at 2,000 publicly traded companies.*

## All Things to Some People

**Only the multifaceted survive.**

**That's the prognosis for Internet service providers, according to a December 1996 Business Research Group (BRG) study of the various types of services offered by 60 regional and national ISPs.**

**"The number of ISPs in this country doubled last year," says Paul Johnson, the industry analyst who conducted the study. "Those that are going to make it will have the business clients."**

**To get them, says Johnson, more and more ISPs are offering value-added business services, such as electronic storefronts and credit card transaction processing. The BRG study found, for example, that 85 percent of ISPs will host a customer's Web site and that 33 percent offer at least some electronic commerce services.**

**"Even the smaller ISPs are moving in that direction," says Johnson. "It's something they have to do. When you're spending $100 or more to get a customer, there is very little margin in a $19.95 residential account." *–Art Jahnke***

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If the net is all about breaking down walls, how do you make sure a few still remain? The Internet promises accessibility. That is also its threat. But with HP's Praesidium enterprise security solutions like VirtualVault, exportable encryption and the latest smartcard technology, only the people you designate have access to your information. Our security solutions span any environment. And secure any enterprise. Come on in and see at www.hp.com/go/security Capitalize on chaos.

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# An Opening Gambit

THE WORD "empowerment" draws sniggers these days, particularly in those companies that donned its trappings without adopting its principles. Now into the breach steps open-book management (OBM), a more focused approach to smudging the line between employees and management.

The fundamental OBM precept is that companies should share all or most of their financial information with all or most of their employees. Employees, who are trained to make sense of cash-flow statements, balance sheets and the like, are then expected to assume more responsibility for those numbers. Typically, OBM companies tie compensation or bonuses to improved results.

Sounds like a job for the intranet, says John Zavacki, principal consultant for The Wolff Group Inc. (*www.wolff.com*). "One of the things that's been missing in the quality and productivity area is that you can't improve something unless you understand it, and in business, you can't understand it unless you know how much it costs," Zavacki says.

Intranets present two major benefits for OBMers, Zavacki says. First, they make it easier to distribute financial reports daily rather than monthly, as is done in most organizations. Second, they give large numbers of people access to that information.

While OBM is popular mostly with the small-business crowd, a few major companies are giving it a try. At Sony Technology Center's San Diego picture tube plant, for example, Line Production Manager Kirk Imamura wants his employees to "better understand what it means to profits if we create defects or have equipment go down."

Imamura began by reformatting information from Sony Technology Center's mainframe-based financial system, combined it with plant production data collected by an existing Windows-based system to generate daily reports, and then set up a Web server to get those results out to the plant's 32-inch picture tube production line's 200 workers. Employees now use the intranet to view slices of parts and labor figures (by day, month, department, etc.), check hourly production output and send questions to management. "The supervisors use it quite a bit," Imamura says, "and we're getting a good response from the floor." WM

*–Leigh Buchanan*

## Directory Assistance

**Let your fingers do the pointing and clicking.**

**That's what residents of San Jose and Santa Clara, Calif., can do with the new print *Pacific Bell Smart Yellow Pages* distributed last February by Pacific Bell Directory. Each of the 550,000 new directories includes a 14-page Internet Guide that groups more than 600 businesses under the book's 250 traditional subject headings. While directory publishers such as Ameritech Inc. and Nynex Corp. have included electronic addresses in their pages before, this is the first time a publisher has devoted an entire section to e-mail addresses and URLs.**

**Pacific Bell Directory provided the free listings to companies that already promote their e-mail addresses and URLs in their Yellow Pages advertisements, says Nancy Swasey, a spokeswoman for the publisher. With an FAQ section that addresses ISPs, firewalls and netiquette, the guide also offers a list of civic Web sites and URLs of general interest.**

**Pacific Bell Directory's move is a strategic attempt to make the Yellow Pages a timely business resource, says Larry Small, vice president of marketing services for the Yellow Pages Publishers Association (YPPA), the country's largest organization of Yellow Pages publishers. Because the Yellow Pages and the Internet are directional media (that is, they help people find things), directory publishers must keep up—and help their users keep up—with new technology. "Everybody wants to be on the information superhighway, but at the same time, there are more people using the paper product than using the electronic product," Small says. "We're trying to ease that gap and educate customers."**

***–Heath Row***

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"I want answers Frank, how fast can we move on this?"

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I R O N L G H T

# Losers Weepers

IF YOUR VISITORS CAN'T FIND IT, THEY MAY DECIDE THEY DON'T REALLY WANT IT BY JIM STERNE

**Coming up out of a subway station is horribly** disorienting. You can spot the street signs, so you know what corner you're on, but what direction are you facing? Which way is your destination? Why aren't there arrows pointing north at subway station exits all over the world? And while we're at it, why isn't there a standard approach to Web site navigation?

When I arrive on your electronic doorstep, I have a fairly good idea of where I am. Your corporate logo is prominent, and there's a short description of what your company does for a living. But as soon as I step off the home page and into the traffic of your pages, it's easy to get lost. The challenge for Web site designers, therefore, is to make navigation information as comprehensible as possible.

One guideline is to remember that your visitors aren't you, so don't organize information from the corporate perspective. AT&T Corp.'s home page offers me a choice of services: "Discover better ways to communicate at work, at home and on the Net." "Work," "home" and "on the Net" are links. Maybe that makes infinite sense to AT&T, but I run my Internet business out of my home.

For a real dose of disorientation, try finding a gas analyzer at *www.siemens.com*. The home page says nothing about products, so click on "Business Information." Skip over "Business Segments" and go to the "Product Directory," where you are told, "To browse alphabetically, just click on the first letter of the product's name." Assuming Siemens Corp. doesn't name its products XLZ-17 or MoonUnit, try "G." And there, fifth from the top, is "Gas Analyzers"!

Oh, you thought you were done? No, no, no. Across from "Gas Analyzers" is a hyperlink to Siemens Energy & Automation Inc.—actually to a page full of division names and addresses. Fortunately, the entry for Siemens Energy & Automation is a live link to *www.industry.net/siemens*, where you can click on "The Latest New Products & Developments." There you will find a list of press releases, some of which have to do with...what was it again?

But it's more instructive to look at a company that's doing it right, such as Hewlett-Packard Co. Time was, if you went looking for a printer on the HP site, you would begin by scanning the home page for the "Products" button. Then, if you were at least a semi-nerd, you knew enough to click on "Peripherals," which would lead to the "Printers" button, in all its glory. Not exactly the shortest distance between two points.

Hewlett-Packard took a look at its logs and discovered that quite a few people were interested in printers. In fact, enough people were interested that the company took a bold step: It changed its home page. Now the very first button is "Printing & Imaging." Nice work, Hewlett-Packard.

For locating more complex information, more sophisticated tools are required. The Web builders at Sears, Roebuck and Co. knew they faced an uphill battle trying to point the way to more than 2,000 products in Sears' Craftsman line. Their solution, called The Craftsman Tool Search, puts technology to good use.

A Java applet offers five tool categories. Click on a category, and its contents appear in an indented list. Another click, another indented list. That arrangement allows you to move quickly through "Bench/Stationary Tools" to "Compressors" to "Nailers, Staplers & Accessories" before the browser returns to the server for a list of the 18 available products. One more click takes you to the 3 1/2-inch angle framing nailer of your dreams.

Search engines, as we've all come to know, are as handy for finding stuff on a single site as on the Web as a whole. Excite Inc. still offers its excellent search-by-example tool,

ILLUSTRATION BY PAMELA HOBBS

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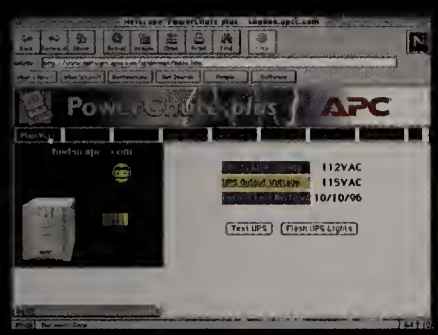


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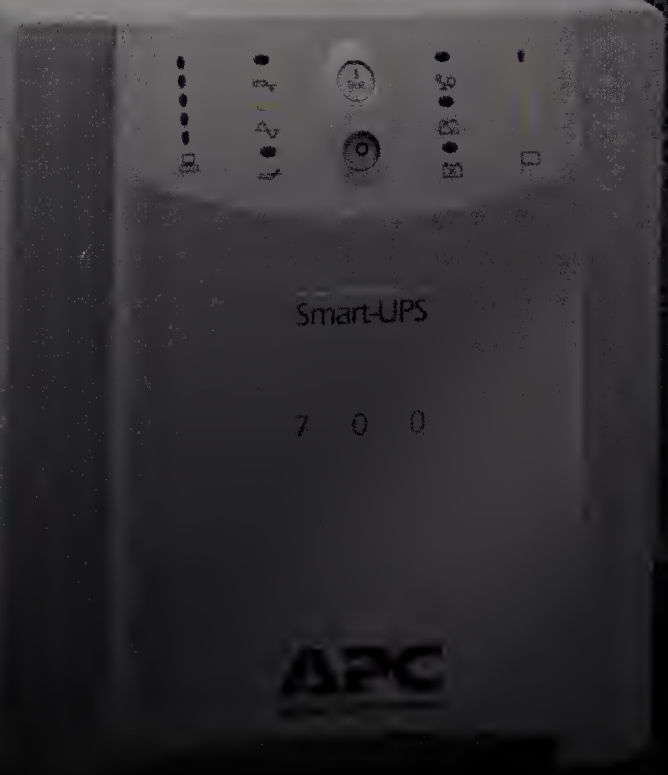


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which lists results for the next round of inquiry free, and Digital Equipment Corp. has AltaVista, one of the more powerful search engines you can buy. But if you are offering complex products that require elaborate configuring, Step Search may be your man. I tripped over this product years ago when its parent company, Saqqara Systems Inc., was just a handful of people, some thoughtful technology and a wonderful interface.

The IBM Corp. ThinkPad selector is one of several demos on the Saqqara site's Step Search Gallery page. The screen fills with a lengthy list of features in the left-hand column and myriad options for each feature on the right. Any sane person confronted with such an enormous number of choices would turn tail and flee. That's where the wonderful interface comes in.

Step Search relies on a sorting tool that responds to user input. The tool asks you to select options one at a time based on level of importance. Is processor speed your top priority? Then choose your speed. If you picked the high end, Step Search tells you, among other things, that there are four ThinkPads in the database. It shows you that none is pen-based, that all use Intel Corp. processors and that the resolution on each is 800 by 600 pixels. Then it lets you choose again. Would you rather decide between a 1.08GB drive and a 1.2GB drive, or between an active-matrix display and a passive-matrix display? Pick the larger hard drive, and a ThinkPad model number is displayed. Select the active-matrix display, and three models from which to choose appear.

The power and the glory of this method are that it gives decision making back to users without requiring them to become fluent in SQL or to understand the difference between a Boolean search and a concept search. Essentially, it allows humans to approach the problem as humans.

OK, SO YOU DON'T HAVE a team of people who can study HTTP logs all day long, nor do you need to manage complex data with a nifty tool. But you still need to let your site visitors know where they are and where they can go in an easy manner. Consider the lessons learned along the way by Novell Inc.

In its first iteration, Novell's home page menu looked like a set of the company's familiar red manuals. Then the company adopted its pingpong-balls-in-space logo and changed its site navigation strategy. The site designers added an icon bar that included a bolt of lightning, a compass and a triangle with a circle in the middle and an arch over the top.

Astute surfers noticed that the right-hand scroll-bar was gray and thus indicated there was more in the offing than met the eye. Scrolling down revealed the labels below the icons. The bolt of lightning was called "New," the compass was tagged "Tour" and the triangle was labeled "Sales." Semicomprehensible. But the company must have taken some grief over those icons because now the Novell home page buttons contain—text! That's right: plain old, easy-to-comprehend text. Brilliant.

But navigational clarity must extend beyond the home page. Venture past the entrance to Seiko Epson Corp.'s site, and you will find menus and submenus at the top of every screen. With its emphasis on ease and utility, Epson clearly understands that it is building a software application, not an electronic magazine.

So how do you figure out what's easy and useful? Talk to your company's human factors engineers, the experts in ergonomics. Think about software interface design. Investigate the services of companies such as the Reuters Usability Group, which tests software in a glass room with video cameras running and engineers tracking how hard it is to use your latest release. Perform testing like that of National Semiconductor Corp., which asked groups of 50 electronics engineers to compare its Web site with those of its competitors. Those were blind tests, and for that reason they were particularly reliable. Because the engineers didn't know who was doing the research, they commented more freely in their responses to the questions.

Don't stop there. Create visual clues to help visitors see where they've been and to suggest where they might go. Provide a floating index in a separate window. Color-code your departments. Track where users have been and what search terms they're using and make suggestions.

Make the computer help people, not confuse them. That way, when users hit your site looking for information, they won't feel like jumping back on the subway to another destination. WM

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**The Reuters Usability Group**
*www.usability.reuters.com*

**Saqqara Systems Inc.**
*www.saqqara.com*

**Sears Craftsman Tool Search**
*ww.sears.com/craftsman/toolbox/toolsrch/toolsel.htm*

**Sears, Roebuck and Co.**
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*Jim Sterne* (jsterne@targeting.com), *president of Target Marketing of Santa Barbara, is an Internet marketing strategy consultant and the author of* World Wide Web Marketing *and* Customer Service on the Internet.

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FORTUNATELY, THE UPFRONT COSTS OF ESTABLISHING AN INTRANET ARE FAIRLY PREDICTABLE. UNFORTUNATELY, ONLY ABOUT 25 PERCENT OF YOUR COSTS WILL BE UPFRONT. **BY RANDY J. HINRICHS**

# Pay As You Grow

**Budgeting for an intranet is like figuring** out how much it costs to raise a child. The diapers, crib and formula make up only a small part of the equation; it's the years of orthodontia, oboe lessons and college tuition that set you back.

Of course, you want all those things so that your children can live up to their full potential. It's the same with an intranet. Yes, you can build a system that has no other purpose than to make information available 24 hours a day. But if your company is like most, you will want to develop your intranet into a highly competitive "infostructure" capable of supporting rapid collaborative product development, communication, audience management, real-time messaging and—ultimately—lucrative Internet commerce.

Creating a game plan for that evolution will help you budget realistically. As a rule of thumb, only about 25 percent of your intranet budget goes to building the system. Investing large sums at the beginning isn't necessary, because intranets are content-neutral. Unlike with traditional development, you don't have to specify what applications you intend to build.

Once your staff is using the intranet for design and collaborative development, you will begin to see where the other 75 percent of your budget will be spent—on content management, content maintenance and technology enhancements. Think of it as financing the man, not the child, and you'll get a good idea of what you're in for.

## Intranet Costs at a Glance

**Average costs per year to run/maintain intranets:**

| | |
|---|---|
| **BASIC:** | **$50,000 to $100,000** |
| **MIDSIZE:** | **$200,000 to $300,000** |
| **LARGE:** | **$300,000 to $1.5 million-plus** |

### Direct Costs

FORTUNATELY, the upfront costs of building an intranet generally are predictable, although they will vary with system size and functionality. Direct costs include hardware, software and administration plus outlays for things like training, configuration and communications setup.

Hardware costs include local and wide area network technology, servers, clients, hubs, routers and telephony. Large companies will have most of that already; smaller ones that can't afford the investment may work with an Internet service provider (ISP). The setup for basic intranets running e-mail, Web pages and newsgroups can be as rudimentary as a $2,000 Pentium with a 28.8Kbps connection. If you're going the ISP route, expect to pay $10,000 to $50,000 a year for space on your contractor's server, design services, and consulting and programming for database-reliant and interactive applications.

Midsize businesses creating sales and marketing repositories with internal product page integration will have to think bigger. First, you'll need a $6,000 to $20,000 enterprisewide server coupled with a more robust connection and bandwidth. (T1 lines at 1.54Mbps should do the trick; figure $6,000 to $10,000.) Web server software licenses run $5,000 to $20,000 a year; application development will put you back $60,000. And again, as with smaller companies, if you're using ISP resources, that's $10,000 to $50,000.

Companies with intranets that integrate large databases and other legacy systems will need a full-service enterprise solution. A server platform with storage array runs around $20,000, with annual server software charges of $4,000 to $20,000. ISP connection charges for T1 or T3 lines can get expensive, and while bandwidth prices vary from region to region, you can count on spending $10,000 to $50,000 a year. Application development will still run you about $60,000. And since large sites often depend heavily on interaction with the Internet, you'll need to budget $3,000 to

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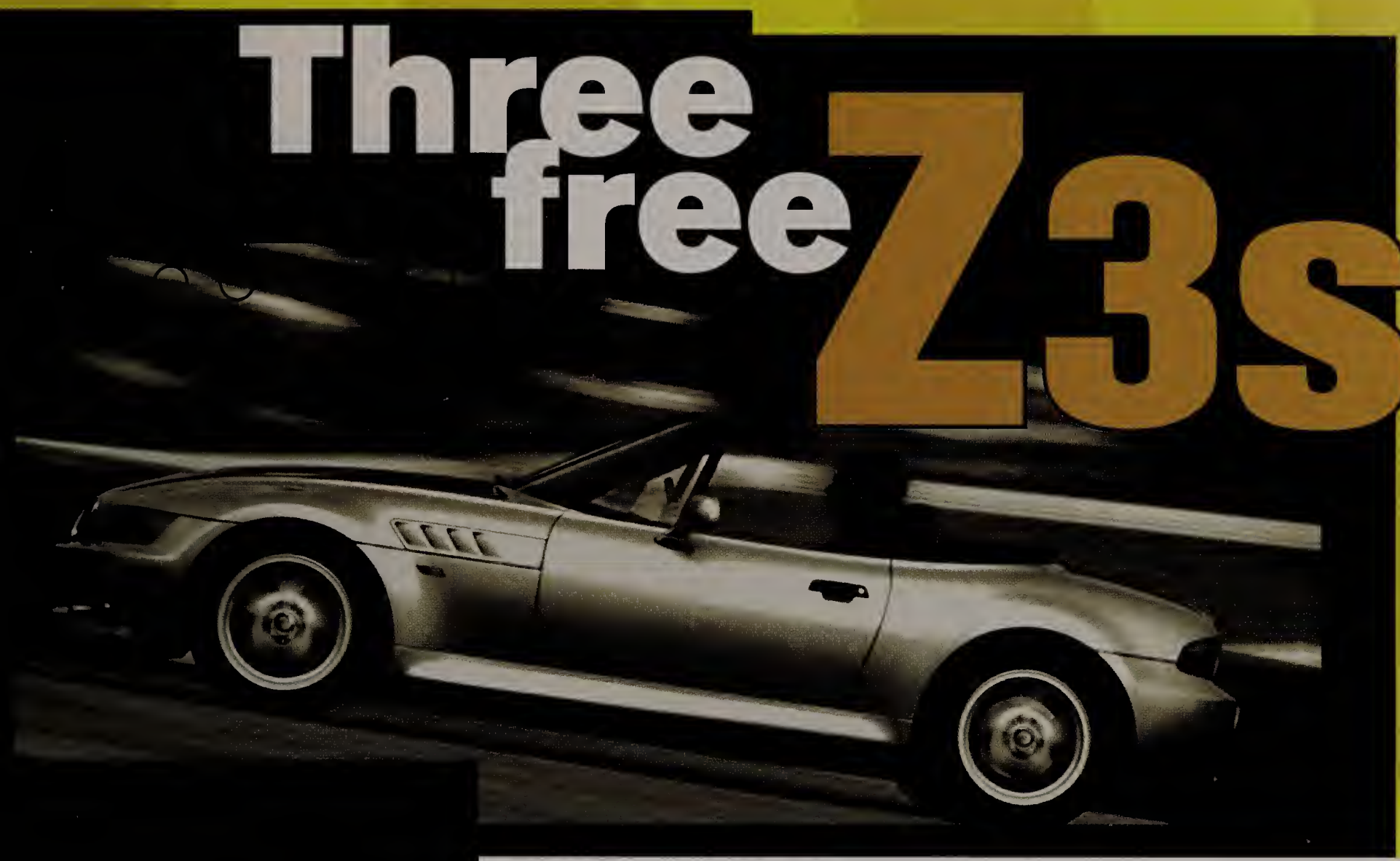

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You may also want to invest in some of the numerous servers available—directory, catalog, caching, news, proxy, certificate and so on. Fortunately, leading vendors offer many of these free or at low cost, and much of the software can be downloaded from the Internet. Products such as catalog tools and search engines may add $6,000 to $20,000 to the price tag.

You'll also need application software to manage documents and other content as well as to administer the intranet. As with traditional applications, the greater the functionality, the more expensive the software.

Then, of course, there are people. Because working on and with the intranet is increasingly part of many jobs, the costs of operating a Web team are inseparable from existing human resources costs. Still, some staff will assume additional responsibilities. You will need people to plan, design and test the Web site; to review content for legal problems; to create content and graphics; to program; to manage e-mail; and to provide technology support, quality assurance, and strategic and technical guidance.

As for dedicated personnel, the range for webmaster salaries is $40,000 to $100,000. Additional technical staff will probably cost $80,000 to $200,000; and customer service will ratchet up the price by another $60,000. If you're outsourcing the construction of your infrastructure, anticipate spending $50 to $100 an hour, depending on where your contractor is located and how much experience it has. Training can range from $10,000 to $100,000, depending on how you use the technology to drive instruction.

All told, the annual cost of operating an intranet client in an enterprise environment adds up to less than $2,500 per seat, while operating desktop-centric clients on systems such as Windows NT, Windows 95 and Unix clocks

| Type of Intranet | Direct Costs | Generational Costs | Uses |
|---|---|---|---|
| **BASIC** (first generation) | • Basic LAN running TCP/IP<br>• Centralized server<br>• Mail server<br>• Software<br>• Administrator | • Document conversion<br>• HTML authoring<br>• Content management<br>• Network load | • E-mail<br>• Home pages<br>• Links<br>• Attaching documents, graphics, sounds |
| **PUBLISHING LIBRARY** (second generation) | • Specialty servers<br>• CGI programming<br>• Database maintenance<br>• Data storage<br>• Document management<br>• Version control<br>• Document conversion<br>• Search engines | • Content management<br>• Common look and feel<br>• Software tools<br>• Form development<br>• Training<br>• Help desk support<br>• Bandwidth | • Product pages<br>• Centralized Web sites<br>• Document management<br>• Search capability<br>• Index, cataloging<br>• Replace bulky e-mail solutions |
| **COLLABORATIVE** (third generation) | • Forms-based programming<br>• Integration with legacy systems<br>• Cohesion with specialty software (e.g., Lotus Notes)<br>• Multimedia scripting<br>• Storage | • Legal issues<br>• Increased awareness of the internal client<br>• Calendaring and scheduling<br>• Migration<br>• Data loss, data omission | • Enhance product development<br>• Interactive sales and marketing<br>• Business simplification<br>• Aligning financial processes and reporting<br>• Audience management |
| **TRANSACTIONAL** (fourth generation) | • Security servers<br>• Full-service intranet connections<br>• Encryption technology<br>• Thin clients with TCP/IP on every machine<br>• Web administrative staff with every application<br>• Interface programming skill<br>• Database integrators with Java, ActiveX, Shockwave, VRML<br>• Data warehouse development | • Profiling internal audiences<br>• Developing internal network-centric applications<br>• Maintaining an infostructure<br>• Security leaks<br>• Workflow | • Create data warehouse<br>• Full integration of automated business process<br>• Impacting the global market<br>• Participation and quick response<br>• Integrate finance, purchasing, accounting, sales, marketing, engineering, operations and certified learning |

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in somewhere from $10,000 to $15,000. If you're after something fancier à la Java, Microsoft Corp.'s ActiveX, VRML or Macromedia Inc.'s Shockwave (not to mention application programming interfaces from Netscape Communications Corp. or Microsoft), expect to shell out another $1,000 to $2,000 per developer for automated development tools.

### Generational Costs

THE FIRST-GENERATION intranet is essentially a publishing environment. The costs for such a setup are fairly low, but as your intranet matures, new expenses will crop up in such areas as storage, content development and management, human resources, planning and information management.

As your intranet becomes more interactive, you'll find yourself spending more to work in various application environments, especially Java, ActiveX and other object-oriented languages. Programmers skilled in those areas are scarce, so expect to pay top dollar. And keep in mind that your costs will increase proportionally to the level of integration with back-office systems.

If you want your intranet to find information for users even when they're not online, you'll have to build intelligent navigational tools that let them construct personal profiles. You'll also have to manage new access chores, such as tagging documents so that search engines can pick them up easily.

An intranet can be a marvelous tool for such collaborative activities as rapid decision making, product development and process improvement. But creating such an environment means merging with existing groupware applications, enhancing interactive functionality with whiteboard and meeting software, and integrating legacy systems and existing databases.

If you really want to get fancy, add agents for profiling and managing internal audiences, companywide calendaring and scheduling, desktop faxing, forms and workflow development, multimedia presentations, intranet-ready project management software and videoconferencing. Vastly enhanced bandwidth has reduced videoconferencing costs from $2,000 an hour 10 years ago to $20 an hour, with a comparable drop in the cost of hardware. Today, you can get away with spending as little as $500 for hardware.

A well-stocked intranet quickly can turn into an asset you want to make accessible to the outside world—or some portion of that world, such as customers and suppliers. In such situations, security becomes an overwhelming concern. Companies pursuing an extranet strategy—opening up the intranet to selected outside users—should count on spending $5,000 to $100,000 for hardware and software products (including firewalls, encryption and certification technologies).

Maintaining security isn't cheap, but enabling transactions can be downright expensive. If you expect to do financial transactions over an extranet—something that is becoming more common as companies Web-enable their supply chains—you may need to budget for authentication, EDI applications to partners or back-end systems, storefront catalog databases, search engines, online payment processing software, and software to monitor customer actions and customer service options. All told, electronic commerce systems can range from $300,000 to $1 million. That is a rough estimate, of course, but it includes everything from server to security.

### Hidden Costs

IT'S TOUGH TO PLAN for what you can't see. Recognition of hidden costs should help your intranet budget remain closer to fact than fiction.

An intranet, like the tree falling in the forest, has no impact if no one hears about it. For that reason, companies must dedicate resources to internal marketing. Then come the costs of training, technology support and internal consulting for those building their own pages and applications.

You'll also need human resources to develop a navigation strategy and a common look and feel. You may want to do some benchmarking as well: Fruitful areas include managing strategy and developing supporting policies and procedures. Add to that the cost of data that gets lost either during conversion or because certain documents were omitted from the system.

Anticipate the soft costs of not finding a better way to automate, test and check transaction reliability. Legal problems arising from information misuse also may come back to bite the unwary. And loss of strategic information through e-mail can cause serious delays in scheduled production.

Hidden costs can be minimized by careful planning, but don't be surprised to spend $20,000 to $50,000 on things you hadn't anticipated.

### ROI Smoke Screens

PERHAPS BECAUSE Internet investments are so difficult to justify, consultants are proclaiming with glee that intranet ROI is both measurable and impressive. Studies have announced positive results after balancing costs against productivity gains, print and paper savings, and other factors. (The study that caused the biggest stir, conducted last year by *WebMaster* sister company International Data Corp., for Netscape calculated 1,000 percent ROI.)

However, those studies are beside the point. Intranets don't need ROI justification any more than do telephone systems, because they are becoming a part of companies' core infrastructures. Building, managing and maintaining them is simply a cost of doing business. WM

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*Intranet consultant and author Randy J. Hinrichs can be reached at* randyh@flex.net. *This article is adapted from his book* Intranets: What's the Bottom Line? *(Sun Microsystems Press and Prentice Hall, 1997).*

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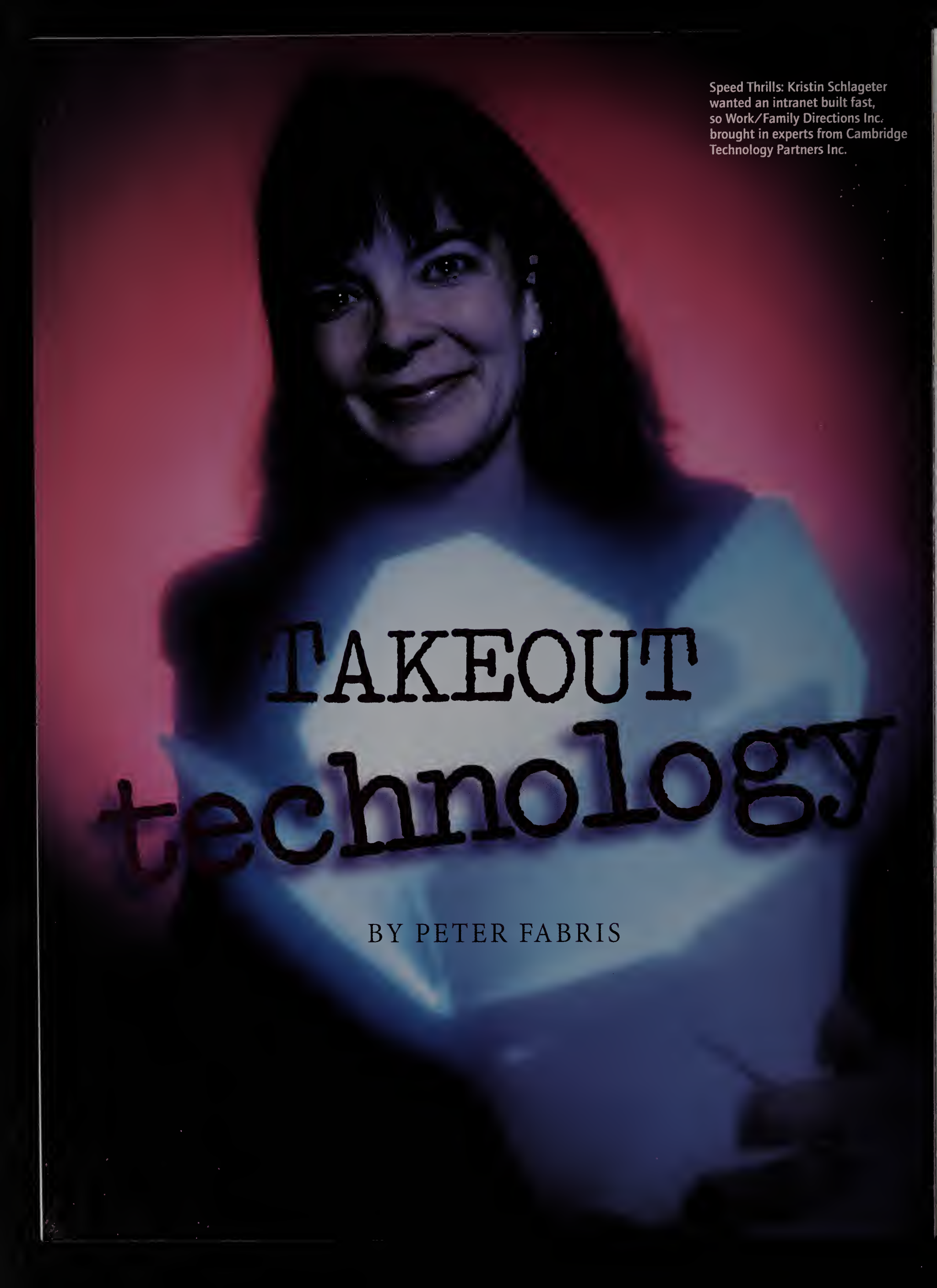


Speed Thrills: Kristin Schlageter wanted an intranet built fast, so Work/Family Directions Inc. brought in experts from Cambridge Technology Partners Inc.

# TAKEOUT technology

BY PETER FABRIS

As commercial transactions and other business uses of the Web pose new technological questions, companies have found an easy way to find hard answers:

# BUY THEM

EXECUTIVES AT Work/Family Directions Inc., a 14-year-old consultancy whose services include giving employees of Fortune 500 and smaller companies advice on personal and work-related issues, realized 18 months ago that the future of its industry was about to leave the runway. A study revealed that 71 percent of the employees at Work/Family's client companies wanted technology-based access to its services and that many companies were already putting such information as benefits plans and job openings on their internal Web sites. For many of the survey respondents, intranet access to HR resources was primarily a matter of convenience. But for others, the intranet promised something even more important: a greater degree of confidentiality than that offered by a conversation with an HR representative.

"Certain people within the client base would prefer not to pick up the phone and ask questions about sensitive issues," says Kristin Schlageter, Work/Family's director of electronic commerce. "Others find our phone hours inconvenient."

Work/Family's leaders knew they needed to offer clients intranet-based services—and do it quickly. They also knew that whatever system they put in place had better be pretty sophisticated, or the company might catch the plane but end up hanging off a wing.

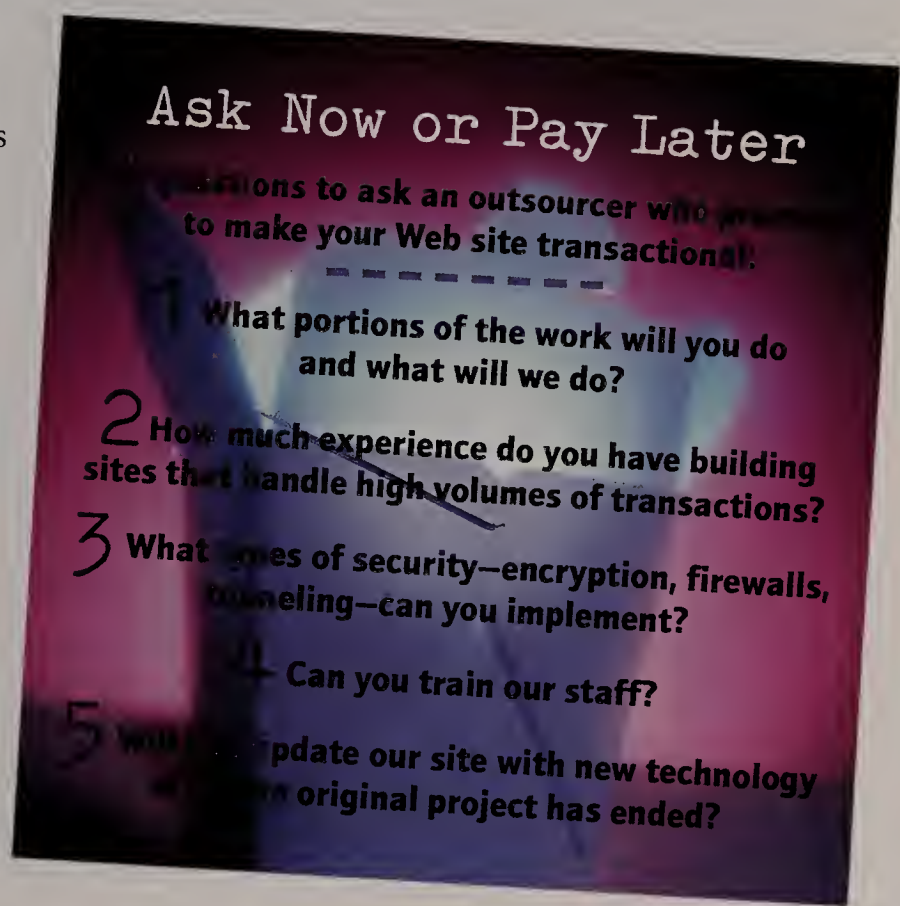
Shortly after the survey was completed in late 1995, Work/Family got started. The goal was an intranet that would allow employees of client companies to view pamphlets and order booklets on such topics as child care and coping with infirm parents. Work/Family also wanted to build an infrastructure that would allow employees to ask for referrals—for elder care providers, for instance—and other information by e-mail. And they were in a hurry.

"We wanted to finish it in four months because we felt our clients were moving forward quickly getting human resources and benefits information on their intranets," says Schlageter. "We wanted to be there with them."

To get things done fast, Work/Family chose not to build the intranet itself. Instead, they teamed up with a technology consulting firm called Cambridge Technology Partners Inc.

Work/Family chose CTP because of the outsourcer's rapid application development expertise and experience with Web technologies, Schlageter says. But the outsourcer also earned its keep in another way: by taking difficult and potentially divisive decisions off Work/Family's busy plate.

"We had to make some tough decisions on which pieces of the project to build and which not to build in the first generation," Schlageter says. "An exter-




PHOTOS LEFT AND RIGHT BY KELLER&KELLER

## Help Is On the Way

Like nature, the consulting and outsourcing industry abhors a vacuum. Major technology consulting and outsourcing companies have rushed in to fill the enormous demand for Internet and intranet services. Here's a sampling of what some are offering.

**Advanced Paradigms Inc.**
*www.paradigms.com*

- Specializes in Microsoft Exchange and related Internet systems
- Integrates legacy systems with intranets
- Evaluates new Net technologies and offers training in Microsoft software

**Andersen Consulting**
*www.andersenconsulting.com*

- Advises clients on business strategy, assesses organizational and technology readiness, and designs process change programs
- Designs and implements Internet, intranet and extranet systems, and manages them on an ongoing basis

**Cambridge Technology Partners Inc.**
*www.ctp.com*

- Builds and maintains intranet-based solutions
- Integrates the Web with client/server and legacy systems
- Integrates customer service call-center systems with Web technology

**Coopers & Lybrand International**
*www.coopers.com*

- Offers best practices reviews of current and planned Internet services; Web application and intranet design and implementation
- Provides Internet analysis, design and testing with a focus on designing gateways to internal company databases
- Advises clients on managing Internet performance

**Electronic Data Systems Corp.—EDS Internet & New Media unit**
*www.inm.eds.com*

- Offers Web site hosting and design (both technical and creative) services
- Helps analyze and plan business needs
- Designs, implements and manages intranets

nal party can be more impartial. They can afford to be the bad guy."

They could also afford to present opinions that chafed against Work/Family's idea of how the project should be designed. Work/Family, for example, heeding their survey results, had planned to deliver their service almost exclusively to their clients' intranets, a technological accomplishment that would have required special software for several technical environments. CTP recommended an easier route: linking Work/Family to its clients via the Internet. Ultimately, both models were built, although Work/Family has come to appreciate (and promote) the Internet model, which can be updated with changes to a single source code.

To build the intranet, CTP put four full-time and two part-time people on the project, and the price tag was not inconsiderable. Still, Schlageter believes that if Work/Family had tried to go it alone, it would have taken at least twice as long and would have required Work/Family to hire at least as many workers as CTP assigned to the task. As it was, things worked well, and in November of 1996, Work/Family rolled out an extranet that will soon have a secure Internet connection. Employees of Work/Family clients are able to access Work/Family's offerings from their PCs. Outsourcing, says Schlageter, was the right choice.

As business use of the Web evolves from marketing and promotional purposes to offering online services and transactions, companies often find themselves in the deep end of the IS pool. After all, building and supporting Web-based transaction applications is far more complex than creating and posting content. So it's no surprise that more and more Web work is being farmed out to experts. Two years ago, less than 10 percent of CTP's business was Internet-related. Today, says Malcolm Frank, the company's vice president of marketing, Internet and intranet work accounts for more than half of its projects. One market research firm, Input, predicts that Internet and intranet outsourcing business will grow from about $300 million last year to $14.2 billion in 2001.

Companies turn to outsourcers for a number of reasons: The companies themselves may lack the in-house expertise in Web or related technologies, they may need to ramp up Internet/intranet projects quickly, they may want to offload back-office processes such as credit card authorization and order fulfillment, or they may appreciate the hassle-free advantages of creating virtual private networks using a third party's infrastructure.


www.web-master.com/

"We had to make some tough decisions, and it was easier for an external party to be the bad guy." -Kristin Schlageter

Frank says that for those companies hiring outsourcers, one of the major attractions is speed. Net projects, he says, tend not to last as long as other types of outsourcing arrangements. Electronic commerce projects, in particular, tend to have abbreviated schedules, perhaps because they are driven by business managers or even CEOs who do not have the patience that IS managers have for technology projects.

Another attraction, of course, is simply having someone who has been there before to lead the way. Although they don't want to admit it, says Frank, many IS managers are almost paralyzed by the fear of making a misstep. "Some [IS managers] are thinking, 'I'm catatonic,'" he says. "'I fear whatever I choose will be wrong in six months.'"

By working with Web technologies on many projects, outsourcers acquire a depth of specialized knowledge that few IS shops can match. Some outsourcers form relationships with vendors to beta test new products. As a result, their clients are able to adopt new technologies early.

THE ALCONE Marketing Group, which operates the NetPerks marketing program, is another satisfied customer of an experienced consultancy. NetPerks is a frequent surfer program that allows netizens to reap rewards from sponsors in return for visiting certain Web sites. Alcone Marketing's business model hinges on its ability to get people to visit NetPerks' sponsors' sites and to provide demographic information about those visitors. The company also has to keep track of visitors' frequent surfer points and make sure they get their rewards, which include such things as free Internet use, product coupons and online magazine subscriptions.

To do that, NetPerks must support some sophisticated functions that recognize individuals as they visit various sites and then customize content for them in real-time. For example, a parent of young children would click on an automaker's ad and be shown the latest minivan models, while an unmarried college student might be shown a sports car.

"We, as a marketing and sales promotion company, don't have the resources available to do that work," says Linda Henry, executive vice president of Alcone Marketing Group. So the company found another that did: Electronic Data Systems Corp. (EDS).

Today, EDS hosts the NetPerks Web server, but the relationship goes well beyond standard ISP services. The outsourcer, which built the system in collaboration with Alcone Marketing, also provides programming that allows the company to integrate its database with a sponsor's back-end system. For example, if an airline wanted to let users convert NetPerks points to frequent flier miles, it would have to extract information from the NetPerks database and convert it into a format that fits its system. EDS does that for them.

Why can't Alcone Marketing write its own program? It could, says Kevin Knight, the company's webmaster and director of creative technology, if EDS built a master interface to connect the NetPerks database system in Plano, Texas, with Alcone Marketing's Novell LAN in Irvine, Calif. But the convenience offered by EDS and the experi-

Convenience Store: Linda Henry and Kevin Knight chose to outsource NetPerks' ISP services as well as much of the company's programming.

PHOTO BY LARA JO REGAN

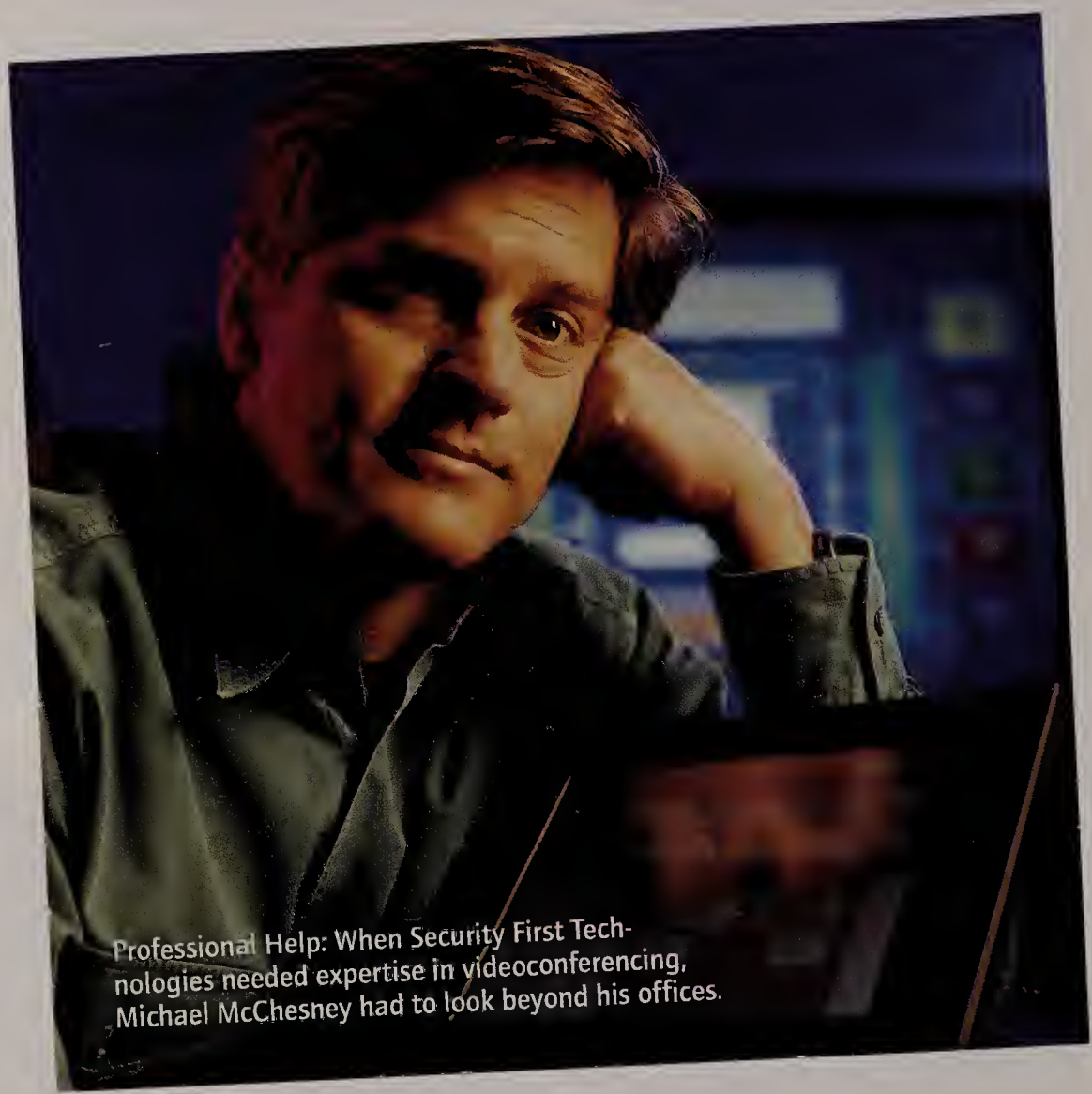
ence on which EDS can draw are hard to resist.

"Our programmers are accustomed to client/server systems, LANs and Windows workstations," Knight says. "EDS has the programmers to do Unix and mainframe programming."

The service that EDS offers NetPerks, integrating legacy database systems with Web applications, happens to be one of hottest areas for outsourced work. When customer service, manufacturing resource planning, inventory, billing, distribution and finance systems are integrated so that all the data they contain is accessible via desktop browsers, the thorniest problems involve ensuring that data in each system is consistent.

"Technical difficulties often have little to do with the Web itself," says CTP's Frank. "Data integration on the back end is what is most difficult."

Sometimes, even a company that is well versed in Internet technology will outsource a Web project, particularly when the application it hankers for is truly cutting edge. That was one reason Security First Network Bank (SFNB), whose Security First Technologies division develops software for Internet banking, chose not to create a Web-based multimedia customer service project on its own. SFNB is one of several companies betting on the convenience of electronic banking.



Professional Help: When Security First Technologies needed expertise in videoconferencing, Michael McChesney had to look beyond his offices.

"With e-mail, we spend about $3 in staff costs on a customer service call," says Michael McChesney, chairman of the bank and CEO of Security First Technologies.

To reduce those costs, SFNB is laying the groundwork to answer customer inquiries using Web-based communications technologies such as Internet chat, Voice on the Net (VON) and videoconferencing. "We have the Internet expertise in-house but not the expertise for a traditional telephony call center," McChesney says.

The bank's plan relies on a relatively new technological feat: switching between an automated analog telephone call distribution center and TCP/IP protocols. "Having people who understand telephony and Internet technology is rare," McChesney says. So the company called in CTP as one of eight vendors coordinating telephony efforts. SFNB's relationship with CTP likely will continue as the system evolves. McChesney says that once the bank's Web-based applications are up and running, he hopes to market them to other banks.

As with traditional outsourcing projects, not all Web engagements end when the new system is shiny and complete. Many companies simply don't have the back-office systems for authorizing credit card payments, batching orders to fulfillment houses, sending order confirmation notices to customers and the like. Outsourcing firms will do that, too. Typically, they work with small startup companies, which usually have limited IS resources, but sometimes large, well-funded Web sites go that way as well.

iVillage Inc., the company behind Parent Soup, a Web site that publishes parenting information, earns most of its revenues from a percentage of sales of merchants' products that are conducted on the site. But iVillage's 15-person IS staff would rather spend its time sprucing up the graphics and interactive features of Parent Soup and its other sites—About Work and Vices & Virtues—than wrestling with back-office transactions. So iVillage signed up LitleNet LLC, a company that had for years provided credit card processing services for the direct marketing industry, to do the grunt work. Now, LitleNet grabs all orders from iVillage's sites on the Web and America Online and sends them in batches to affiliated merchants, such as Avon Products Inc. and Starbucks Coffee Co. LitleNet and iVillage are linked by an automated Unix mail system with PGP encryption to protect sensitive information such as credit card numbers, names

PHOTO BY SONNY WILLIAMS


www.web-master.com/

**One research firm predicts that Internet and intranet outsourcing will grow from $300 million last year to $14.2 billion in 2001.**

and addresses. Merchants then download data from LitleNet into their own order entry systems.

The joint process doesn't stop there. "We require that merchants send order confirmations to LitleNet on our behalf," says Elaine Rubin, iVillage's senior vice president of interactive commerce and a former general manager of interactive services at 1-800-FLOWERS Inc. LitleNet then sends e-mail to the customer to confirm the order.

Such convenience has its price. LitleNet charges between 5 cents and $5 per transaction, depending on their complexity and the volume of transactions going to a single merchant. The simplest transactions capture data from Point A and transfer it to Point B. The most complex and most expensive transactions involve several processes such as order fulfillment, data analysis and payment processing. Still, no one at iVillage is complaining about the costs.

"We don't have to adapt to systems that our merchants have or adapt to any specific network," says Dan Goldman, chief technology officer with iVillage. "And we don't have to keep up with changes to [merchants'] systems. If we had to do that ourselves, it would take away from our ability to support creative work."

Outsourcing is also a handy way to control the risk for companies that are unsure of the viability of the Web as a sales channel. Catalog software reseller Programmer's Paradise Inc., for example, which has been selling software from paper catalogs for 10 years, is outsourcing electronic commerce services as a cost-effective way to test the waters of the Internet.

In addition to questioning the market for software on the Web, Programmer's Paradise worried that electronic distribution would invite credit card fraud.

"We were concerned that word could get out quickly over the Internet if our site was easy to hit," says Jeff Largiader, vice president of marketing.

Those concerns prompted Programmer's Paradise to outsource the transactional piece of the sales puzzle to CyberSource Corp., an electronic commerce outsourcer and online software reseller in its own right.

CyberSource, it turned out, was more familiar with the fraud problem than it would have preferred, having suffered a nightmarish experience with fraud on its own site, *software.net*, where the company markets software on behalf of some of its customers.

"It got so bad that our fraud rate was higher than legitimate sales," says Bill McKiernan, CyberSource's president and CEO.

To save its own skin, CyberSource developed a fraud screen system that analyzes 100 characteristics of user behavior to identify unusual activity. For example, "if your IP address is in Seattle and you're dialing in from Boston, that's unusual," says McKiernan. The system reduced CyberSource's fraud rate to less than one-half of 1 percent.

CyberSource's customers, which include Symantec Corp., Novell Inc., Adobe Systems Inc., Claris Corp. and IBM Corp., aren't likely to build something like that on their own, McKiernan says. Companies don't have a strategic incentive to spend millions on electronic commerce support systems.

It's far more cost-effective to hire a company like CyberSource, whose business arrangements generally follow one of two models. For companies that host their own transactional Web sites, CyberSource charges a $6,000 setup fee plus an average charge of 75 cents per transaction. When CyberSource hosts transaction sites for customers, it charges $3,000 for setup and then about $1.25 per transaction.

The pricing models of CyberSource and other outsourcers are evolving, and they are growing like kudzu as the menu of services and products offered expands. Outsourcing intranet and Internet functions, as CTP's Frank points out, is a market that is just getting off the ground. And it's not coming down for a long, long time. WM

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*Staff Writer Peter Fabris can be reached at* pfabris@cio.com.

## FINDING IT ONLINE

**Cambridge Technology Partners Inc.**
*www.ctp.com*

**CyberSource Corp.**
*www.cybersource.com*

**Electronic Data Systems Corp.**
*www.eds.com*

**Input**
*www.input.com*

**iVillage Inc.**
*www.ivillage.com*

**LitleNet LLC**
*www.litlenet.com*

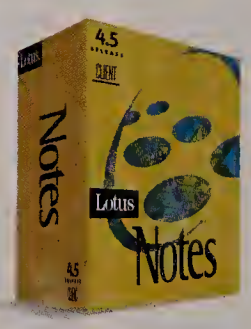
**NetPerks/Alcone Marketing Group**
*www.netperks.com*

**Programmer's Paradise Inc.**
*nj15.injersey.com/prd.i/pgen/paradise/OL/welcome.html*

**Security First Network Bank**
*www.sfnb.com*

**Security First Technologies**
*www.s-1.com*

**Work/Family Directions Inc.**
*www.wfd.com*

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# mixing it Up

**Segregated Internet and intranet development efforts are an idea whose time has come—and gone. Coordinated planning and even collaborative staffing are the wave of the future.**

BY ANNE STUART

ILLUSTRATIONS BY SUSAN LEVAN

WHETHER INSIDE OR OUTSIDE FIREWALLS, the growth of the business Web—GIF by GIF, server by server, with deceptive spontaneity—resembles in some ways the seemingly haphazard creation of such earlier infrastructures as the electric power grid and the railroads. While those entrenched resources now interoperate quite nicely, they certainly didn't start out that way. For instance, the gauge of railroad tracks was unstandardized for many years. And the premonopoly electric utilities were a block-by-block hodgepodge of small generating stations using competing alternating- and direct-current standards.

So, don't be misled. The long process of

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## Road Map *to* Integration

**Following are some tips from consultants and Web developers for organizations seeking the right path to harmonic Web convergence:**

- Draft a concise, consolidated, high-level strategy for all Internet, intranet and extranet development.
- Whenever possible, develop all Web efforts simultaneously from the ground up. Otherwise, as new projects emerge, immediately coordinate them with existing sites, synchronizing efforts from design to maintenance.
- Designate a top-level executive to oversee all Web efforts, even if development splits into separate teams further down the line. Create a small, multidisciplinary core Web team that reports to a larger group of stakeholders.
- If outsourcing all Web projects, try to use a single vendor.
- Encourage (or even require) inner and outer Web teams to share technologies and expertise.

achieving seamlessness is neither easy nor accidental.

In fact, successfully integrating an organization's various Web projects—internal and external, current and future—requires an approach something like what lay behind the building of the first transcontinental railroad, completed in 1869. To build their 1,800-mile miracle, Union Pacific, Central Pacific and the federal government needed to cooperate, plan and pool their resources. If they'd all worked independently, it would have been a long time—maybe decades later—before somebody drove that last golden spike uniting east and west at Promontory Point, Utah.

Yet this lack of coordination is precisely how many organizations develop their internal and external sites: separately, distinctly, competitively. Even when there isn't open hostility, efforts are often segregated, with Internet work typically handled in marketing and intranet control based in IS. But what many organizations are in the midst of learning is that the moment eventually comes when those separate resources must be spliced together—not with a golden spike but with a well-chosen chink in the firewall.

Initially, a divided approach might have made sense because the efforts were intended for different audiences and created to serve different purposes: external sites for public marketing and intranets for in-house information-sharing and collaboration. But those lines are blurring; many organizations are launching "extranets," or expanded intranets, open to both internal clients and selected outsiders (see "By Invitation Only," *WebMaster*, October 1996). And organizations increasingly find that they can gain a competitive edge by integrating all their Web-based efforts—not just from a technological standpoint but from a management one as well.

So why do so many start with, and cling stubbornly to, the fragmented approach to development and management? Experts attribute the lack of cooperation largely to the perception that internal and external Web sites are far more dissimilar than they actually are. "People tend to think of the Internet as a communications medium, and they think of the intranet as the next evolutionary step of computing, basically information infrastructure," says Jon Kaplan, executive vice president and principal of FCI Communications Inc., a Web site development company.

Security concerns also create psychic barriers to cooperation. "[The terms] 'inside the firewall' and 'outside the firewall'...really colored people's perceptions about what the Internet and intranet are and how they're different," says Jeff Shukis, FCI's director of technology.

That "never-the-twain-shall-meet" attitude creates all sorts of problems. Chief among them: "The left hand doesn't know what the right hand is doing," says Frank San Filippo, CIO of W3-design, another site development company. Departments may compete for budgets, miss opportunities to share technologies or waste time and money duplicating resources—such as staff directories or job postings—that could have been borrowed from "the other side," assuming anybody had realized they were there.

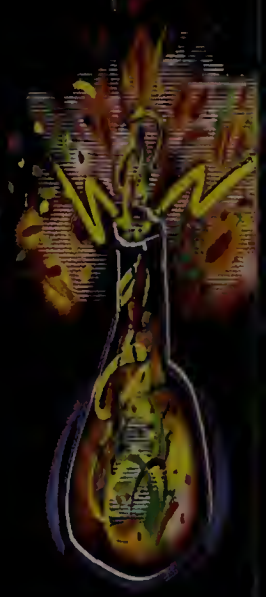
THERE'S NO SINGLE recipe for executing a fully integrated, enterprisewide Web effort (see "Blueprints for Coordination," below). But many organizations that have successfully deployed Internet and intranet projects, either simultaneously or consecutively, have learned to start by integrating their assumptions, goals and even some of their content along with their technology. As Shukis describes it, "They start out thinking of it as two different things—a bunch of pages for internal people, a bunch of pages for external people. We think of it as one pool of data."

Of course, it's easiest if you simply integrate the efforts from the drawing board, as did Kaiser Permanente, one of the nation's largest health maintenance organizations. KP launched its Internet and intranet sites a few months apart in 1996 and continues to oversee them as one big project.

The external KP site—so filled with medical information that CNN has linked to it as a consumer resource—includes a free on-

## Blueprints *for*

**Ask a dozen different organizations how they approach integrating their Internet and intranet efforts, and you'll get as many different answers. But here are some of the most common models:**

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line health magazine and thousands of files on wide-ranging topics such as myths about the flu and advice on how to stop smoking. Later this year, the HMO hopes to provide Web-based customer service in real-time, assisting its 7.4 million members with non-emergency problems such as replacing ID cards and registering complaints. In a separate pilot project, KP has also launched a password-protected, members-only site at which patients will someday be able to schedule appointments, correspond privately with their physicians and refill prescriptions.

Internally, KP uses the Web to provide doctors and other caregivers with pharmaceutical formulas and other drug information, according to Jacqueline De Angelis, KP's director of new media technologies. In addition, says De Angelis, KP's intranet offers employees health education information, a clinical-care discussion group, a clinical-practice guidelines site, and a diagnostic-imaging and radiation-safety site, along with various department internal sites. (For example, the Head & Neck Surgery Web Page presents an interactive journey through the latest guidelines, statistics and innovations in Head & Neck Surgery.) The KP community encompasses 55,000 employees and 61,000 doctors all over California. Down the road, KP hopes to increase its use of the Web for direct online medical care for applications like diabetes screening and other kinds of telemedicine—though De Angelis says that neither the technology nor the comfort level of patients will bring about those changes in the near term.

A core working group coordinated all of KP's efforts from the project's genesis. De Angelis oversees a Web working group consisting of an intranet technology director, an Internet technology director and a physician. "We managed to idea-share and really have a consensus right from the beginning," says De Angelis, who is based in the Member and Marketing Communications group. The working group, in turn, consults with a large group of "stakeholders," such as the customer service call-center director, a pharmacy representative and a health education manager.

**Why do so many organizations start with, and cling stubbornly to, the fragmented approach to development and management?**

KP's top management decreed early on that the organization would have one external and one internal presence, coordinated in design and strategy, rather than a series of loosely affiliated "well-meaning but renegade ventures," says De Angelis. Thus, she adds, "our external communication has a particular look and feel that follows our advertising and branding. Our internal site also has [it] so that employees recognize it."

WHETHER THE coordinated approach starts at the idea stage or doesn't come into play until after the internal and external efforts are up and running, it will succeed only if everyone works in concert. "You have to have a consolidated strategy," says David Luce, manager of Internet development at AST Computer Inc., a global PC manufacturing company.

AST's Web-message strategy can be summed up in three simple questions, says Luce. On the Internet, it's "Why buy AST products?" On the company extranet, open with password control to its distributors, it's "Why sell AST products?" And on Webster, AST's intranet, it's "How well did we sell our products?"

AST, which is also consolidating its Web and EDI efforts into a unified electronic-commerce approach, maintains a technical standards group and a business and applications development group within its IS department. "Each of those groups has a functional IS manager," Luce says. "The challenge is to communicate the strategy to them and to get them on board from the beginning."

At the Research

## Coordination

**WE'RE ALL SINGING IN THE SAME BAND.**
Develop and maintain internal and external Web sites as one major, coordinated project, even if one launches well before the other. Individual staffers may be assigned to one site or the other, but a multidisciplinary Web team oversees both efforts.

**I'LL SCRATCH YOUR BACK IF...**
Develop and maintain inner and outer sites separately but in tandem. Teams reside in different departments, typically with separate budgets and staffing. However, teams cooperate rather than compete, cross-training and sharing resources.

**PARALLEL PROCESSING.**
Develop and maintain inner and outer Web sites exclusively from each other. All managers andstaffers are assigned to one site or the other, with crossover only at the highest executive levels.

**OUTSOURCE, OUTSOURCE, OUTSOURCE.**
Develop one site in-house and outsource the other. Appoint in-house liaisons to work closely with outsourced effort. Otherwise, maintain little or no crossover below top executive levels.

Triangle Institute (RTI), a contract research, development and technical services organization, Webmaster Linda Brigman manages the external site, which went live in spring 1994, while Information Specialist Liese Tajiri oversees the inner Web, launched about a year later. Despite their different backgrounds (Brigman comes from a technical background, and Tajiri is a librarian by profession), they've cross-trained enough to replace each other in a pinch. "We couldn't operate if we didn't," says Brigman, author of *Web Site Management Excellence* (Que Corp., 1996), and a *WebMaster* contributor (see "The Never-Ending Story," *WebMaster*, February 1997). "With limited resources, if I couldn't call them down to help me get out of a bind or they couldn't call on me, I don't think we would get anything done."

Both acknowledge that their cooperation required hurdling the historical enmity between technologists and researchers. "We managed to overcome the most basic distrust that often happens in cross-departmental pairings—the [certainty] that those folks over in the library don't understand us folks in the computer department and vice versa," Brigman says.

She and Tajiri are not only in different departments with separate budgets; they're in different buildings. But "we're in touch constantly throughout the day," Tajiri says. "We're in and out of each other's offices, so if one of us finds something new or an interesting site, we can tell each other." And whenever there's an upgrade, it gets spread across both servers.

While they've hammered out a good working relationship, both would like to see the coordination formalized. "The two of us would like to see one department that delivers all services across the board," Brigman says. "We think that's a better way to go and [that] it would better serve our users." As Brigman envisions it, RTI's inner and outer Web efforts would ideally share a budget, office space and equipment. A single cross-trained design and technical staff would handle all Web development and maintenance and offer Web services to departments and projects that need them. "It would just be so much easier for both of us," Brigman says. "We'd have a coordinated group of people with experience available to all the RTI centers and to all these projects."

BASF Corp., a giant global chemical manufacturer, launched internal and external sites late in 1995. Both were

## Tools *of the* Trade

**Following are some products and services that may help Web teams integrate Internet and intranet efforts:**

**ALLAIRE CORP.'S COLD FUSION 2.0 (*www.allaire.com*): A Web application development tool that can be used to integrate databases with the Web and build interactive applications for intranets or the Internet.**

**FCI COMMUNICATIONS INC.'S MARKETCACHE (*www.fcicom.com*): A program that enables companies to efficiently harvest and organize marketing intelligence and other documents from the Web and other sources and share the information on intranets and extranets.**

**INTERMIND CORP.'S INTERMIND COMMUNICATOR (*www.intermind.com*): A tool that uses "hyper-communications" push technology to let users customize information received from Internet and intranet sites.**

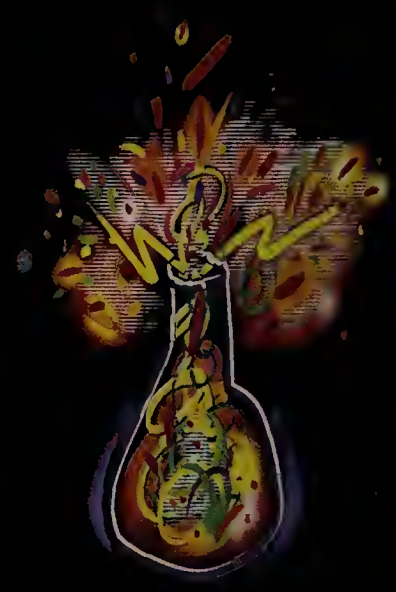
**INTRANET PARTNERS (*www.ip.com*): A consultancy and service provider specializing in intranet migration strategy, design, development, installation and management.**

**INTERNATIONAL SOFTWARE GROUP LTD.'S ISG NAVIGATOR (*www.isg.co.il/index.htm*): Middleware allowing universal data access and enabling users to integrate relational, object and complex data into a single database.**

**PROSOFT I-NET SOLUTIONS INC. (*www.prosoft.com*): A company offering a variety of customized Internet and intranet training courses, including some that focus on integration.**

**SYBASE INC.'S POWERSOFT DIVISION'S INTERNET DEVELOPER TOOLKIT FOR POWERBUILDER 5.0 (*www.powersoft.com*): A package that allows developers to create database-driven business applications for internal and external Web sites.**

**VIRTUFLEX SOFTWARE CORP.'S VIRTUFLEX 1.1 (*www.virtuflex.com*): A server-side product that enables Web developers to build applications that integrate Web sites with databases, e-mail, fax and pagers.**



**WALLOP SOFTWARE INC.'S BUILD-IT (*www.wallop.com*): A Web authoring tool that controls and manages the process of creating large corporate Web applications by integrating and managing components, tools and activities from creation through maintenance.**

**For other Web site management tools, see "The Never-Ending Story," *WebMaster*, February 1997.**

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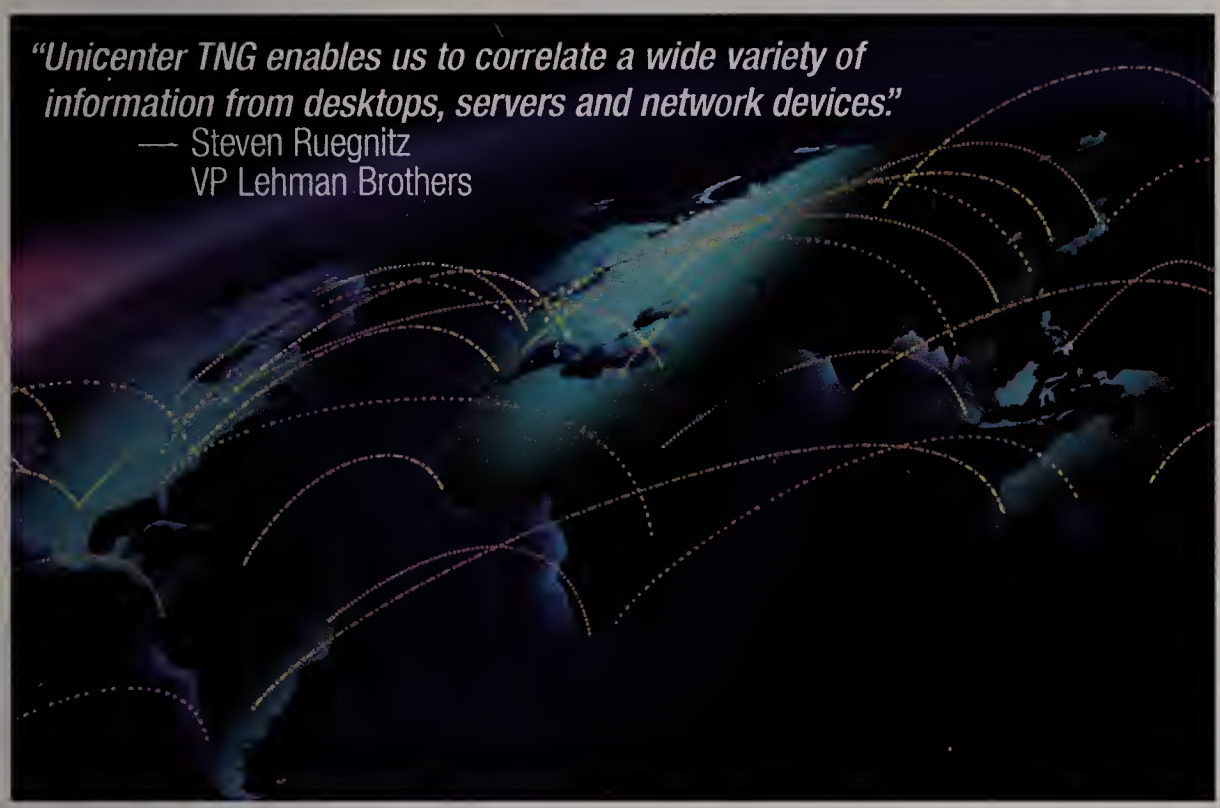

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initiated by the company's Advanced Technology Group but evolved independently in separate teams. "There's not that much crossover, but there was constant communication between the teams," recalls Webmaster John Hilgart. The ATG, as it was known, ran both efforts from a single budget and coordinated development of both with the company's corporate communications staff, then turned management over to Hilgart.

Like Kaiser Permanente, BASF sought a unified corporate public image, so it barred its business units from erecting their own external Web sites. About four of BASF's 18 business units participate in the company's one public Web site. Hilgart says about half of the rest have plans on the drawing board to follow suit. The all-or-nothing rule "has delayed things by three to six months for some businesses," Hilgart acknowledges. "But at least our site has a consistent look and feel."

**By top management decree, Kaiser Permanente's internal and external efforts were coordinated in design and strategy rather than developed as a series of loosely affiliated "well-meaning but renegade ventures."**

Even if every BASF unit eventually wants in, it's no big deal to Hilgart: His company outsources non-content-related operation of its external site to BBN Planet.

As for the inner Web, Hilgart inherited a hypertext system, Ntergaid Inc.'s HyperWriter, that gave employees access to thousands of pages of corporate information along with a few dynamic offerings, such as relevant daily business news. The inner Web team converted that information into standard HTML and formed an internal site that grew since December 1995 from 12,000 to 22,000 pages (the company has since carried out some housecleaning that brought the internal site down to 16,000 pages)—all updated monthly at least, and many pages much more frequently.

At the executive level, BASF still runs its efforts as a partnership between corporate communications and corporate IS. The team's two top members are Hilgart and the company's public affairs manager, "and we make [all] decisions jointly," Hilgart says.

Organizations with well-integrated sites tend to credit their success to progressive and supportive executive involvement. "One thing I thought was a strength in our case was inspired management," Hilgart says. "Our CIO was a great proponent of what we were doing, and that helped immeasurably in getting acceptance by the businesses."

## FINDING IT ONLINE

**AST Computer Inc.**
*www.ast.com*

**BASF Corp.**
*www.basf.com*

**FCI Communications Inc.**
*www.fcicom.com*

**Kaiser Permanente**
*www.kaiperm.org*

**Research Triangle Institute**
*www.rti.org*

**W3-design**
*www.w3-design.com*

Wherever possible, then, it makes sense for organizations to coordinate all their Web efforts as early as possible, creating a key management team that reports to one high-level executive (see "Road Map to Integration, Page 36).

Besides discouraging rivalry, reducing duplication and improving efficiency, coordination helps keep the Internet and intranet sites consistent. That may seem unimportant when the efforts are separate, says W3-design's San Filippo. "[But] a year down the line, you say, 'Oh, let's make this stuff publicly available that's only been available internally,'" he says. If the development hasn't been integrated, "you'll have to hire an outside designer to make [the internal material] compatible with the [Internet site]." Besides, San Filippo adds, consistency can result in greater efficiency because users don't have to learn to navigate two interfaces.

Arguably, cooperation is especially critical when either or both Web efforts are outsourced. "Companies can save a lot of money by going to one vendor rather than parceling out multiple projects to multiple vendors," says San Filippo.

"One of the things we've been advising clients to do is to form an intranet policy group, a subset to the Internet technology group," says Ray Laracuenta, a research director for electronic workplace technologies at Gartner Group Inc. Laracuenta suggests that the group develop "five to 10 bullet points from a very high level, linked to the mission and the strategy of the company, and [aimed at answering the questions] 'Why are we here? Why are we doing this?'"

That group should also develop what he calls "an Internet playbook," a style guide to the sites' business strategy, architectural look and feel, process issues, security standards and other technology considerations. The playbook—which would, of course, evolve continuously—would point developers to servers with templates and other resources intended to both ensure consistency and prevent reinventing the wheel.

No matter which approach organizations favor in consolidating their Web projects, sharing the work from the start will put their teams on the right track. And consistently coordinating management thereafter will ensure that, like the rival railways in 1869, Internet and intranet efforts will converge in the right place at the right time, to the benefit of both. WM

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# procurative powers

*Organizations as different as General Electric and the General Services Administration have found the same way to save time and money while shopping for their business needs: They let the Web do the walking.*

PROCUREMENT IS not a well-loved function. While companies have spent the last couple of decades lavishing attention and technology on other departments ("Take this new sales-support system, please"), the purchasing group largely has been dismissed as a necessary evil.

That lack of respect isn't surprising when you consider that in an average manufacturing organization, 50 to 60 percent of each sales dollar waltzes back out the door through the purchase of goods and services, experts say. And much of that money isn't money well spent. "In general, we assume that the cost of procurement runs between 1 and 2 percent of the cost of the goods purchased," says Tom Elliott, a consulting partner at Strategy Analytics, a recent spinoff of Giga Information Group. "That's 1 or 2 percent that could be down on the bottom line."

But it is starting to dawn on companies that the Internet, which many are auditioning as a sales tool, also can play a role in the way they buy. Most of the attention so far has been focused on processes for purchasing nonproduction goods—the nuts and bolts of buying nuts and bolts.

"A company will have figured out a way to buy steel, but it may not have figured out a way to buy legal pads," says Elliott. "And since nobody really cares that much what brand of legal pads they're buying, anything that reduces paper or expedites query and response—Is it available? How many are in stock? What's the shipping time?—cuts out a whole lot of human effort."

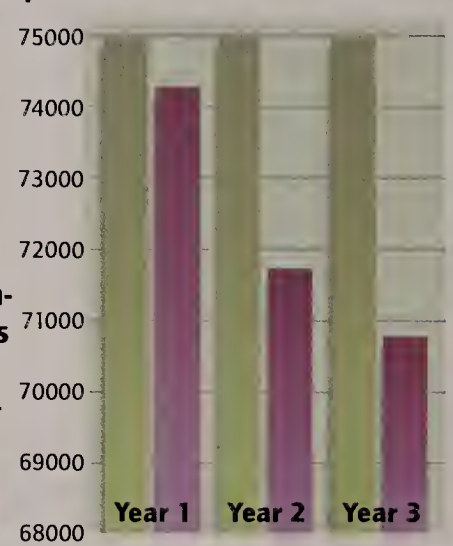
What doesn't cut out human effort is treating the Internet as a wide-open marketplace where every requirement sets off a fresh round of bargain hunting (see "A Small Price to Pay, Page 48). Despite all the talk about online auctions, real-time pricing and other strategies for enticing spot buyers with deals-of-the-minute, most observers agree that large companies will continue to leverage their relationships with established suppliers. "When it comes to business-to-business electronic purchasing, there's an inherent fallacy in the [value of] openness," says Peter Roden, a partner in SupplyWorks Inc., an Internet commerce startup. "If you need to buy scientific supplies, you can go out on the Web and find the cheapest price for Corning glass test tubes. But the time you spend shopping and the discount you get won't come close to the aggregate savings if you channel all your buying to one supplier."

"The trend in purchasing is to develop longer-term relationships with one or two suppliers," agrees Alan Raedels, a professor of business administration at Portland State University. "What the Internet does is give you a wider field to select from when you develop those relationships."

FOR THAT REASON, identifying and researching potential trading partners is the most common procurement activity on the Internet. At networking technologies manufacturer XLNT Designs Inc., Purchasing Manager Mike

## DOWN, DOWN, DOWN

**The chart shows the reduction in the administrative costs, in thousands of dollars, associated with purchases of nonproduction goods over three years at National Manufacturing Inc.**



**THINKING GLOBALLY: At Unisys, Chuck Stemler helped bring 40 procurement groups together to create the Global Procurement**

PHOTO BY JIM GRAHAM

Maiorano consults the Web when he's asked to buy from an unfamiliar supplier or to locate a new type of part.

"Let's say I get a bill of materials [associated with] a new design coming out of the lab, and [it specifies] a manufacturer I haven't heard of," Maiorano says. "I'll go to Web sites of my preferred suppliers to see if they're using them, or I'll check out the company by putting its name in a search engine." If no supplier is specified, he says, "I'll use the search engine to look for the product category, like 'semiconductors.'"

The Web also helps companies searching for specific types of suppliers—minority- or female-owned businesses, for example. "Any time you have a contractual award of

By Leigh Buchanan

**LOOKING FOR MR. GOOD BUY: XLNT Designs Inc. Purchasing Manager Mike Maiorano consults the Web for information on new suppliers.**

PHOTO BY ROBERT BURROUGHS

$500,000 or more [from the federal government], you're supposed to have a subcontracting plan" that includes certain types of businesses, says Charlie Channel, formerly a procurement analyst at Stanford University and now a program manager in Sun Microsystems Inc.'s Supply Management Programs Group. "Sometimes I go [onto the Internet] and say, 'I'm looking for a small or disadvantaged business.' There are starting to be some sites that serve up that information."

International buys, which account for about 13 percent of corporate procurement, also benefit from the Web's worldwideness. "Previously, if you had an obligation to do some purchasing from France, you would have looked through trade journals, dug up some print directories and then maybe contacted the trade delegation from that country," says Raedels. "Now there are several sites where you can get information on international suppliers of specific commodities."

In another twist, organizations that prefer having the mountain come to them are starting to advertise for trading partners and publish requests for proposals (RFPs) on their Web sites. Government organizations—military agencies and state governments in particular—have flocked to this model, and a few have announced plans to accept bids online (see Threads, "Make Us An Offer," *WebMaster*, March 1997).

Posting RFPs on the Web is still uncommon among businesses, which are "far less interested in making sure the whole world sees their solicitations," says Patti Hegland, a senior principal at American Management Systems Inc. A number of companies, however, are experimenting with a set of tools from GE Information Services that lets them solicit and accept bids from selected suppliers over the Internet. Although the Trading Process Network is now offered commercially, its early adopters were mostly GEIS sister companies. The global procurement group at GE Lighting, for example, started using TPN in 1996 to send customized bid packages—containing requisition forms, drawings and other information—over the Internet to its regular business partners. One year later, the procurement group has eliminated

paper and mailing and reduced its cycle time by more than 50 percent.

Computer reseller Lewan & Associates Inc. has experienced comparable time savings dealing with its own trading network through the Internet, according to Executive Vice President Jim Arnold. The company has been using an Internet-based order, specification and configuration system from MicroAge Inc. called ECadvantage that lets buyers source products from multiple vendors simultaneously.

"In the old scenario, we were always on the phone making a call to somebody to see if they had [an item] in stock," says Arnold. "Now we have one common interface that allows us to access all six [of our] aggregators in one browser screen. I would say the time savings are as high as 50 to 70 percent to do a deal."

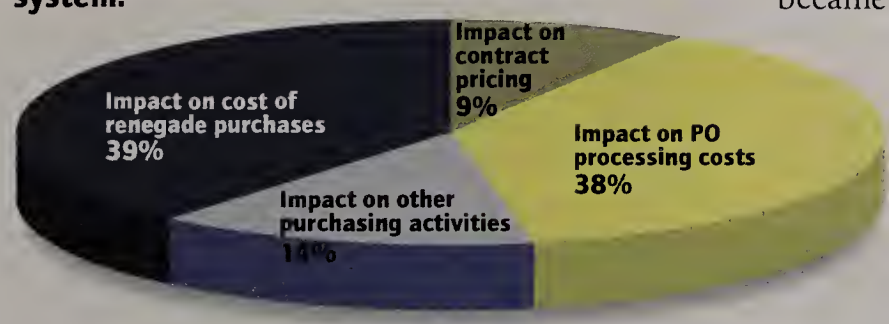
WHILE SOURCING products on the Net is growing in popularity, a few companies also are experimenting with electronic catalogs, either on their own intranets or on suppliers' Web sites. The catalogs, coupled with intranet-based order-management tools, allow purchasing managers to push most of the buying process out to individual requisitioners.

"A large proportion of the purchasing professional's time is spent answering status questions, such as 'Where is the large contract that I need to have awarded to build this building?'" says Hegland. "Now they can use the Internet to take routine buys—where there's already a master agreement or contract in place—and have those buys done by anyone they give authority to. That leaves the purchasing professionals more time to focus on areas where they can really add value, like doing sophisticated contract negotiations and projections."

The appeal of decentralized buying became clear to SupplyWorks' Roden several years ago when, as a manager in MIT's IS department, he worked on a project to reduce the cost of purchasing low-cost, high-volume goods and services. "We did a lot of work to pick the right suppliers, and the next logical step was to let end users buy from those suppliers from their desktops," says Roden. Going the open network

### HONEY, I SHRUNK THE COSTS

**The chart below shows the reductions in purchasing costs resulting from an Internet-enabled system.**




# one-stop shops

**Web-based vertical marketplaces want to be more than just industry matchmakers**

Procurement organizations spend more time managing old trade relationships than identifying new ones. Yet many of the industry marketplaces that have sprung up on the Web in the past few years emphasize matchmaking as their primary role. These vertical malls, which generally make money from their tenant vendors, bring together large numbers of suppliers in one place and provide search tools so that buyers can find what they need quickly and perform transactions using a standard interface across multiple sellers.

Increasingly, however, companies expect online marketplaces to handle the marriage as well as the matchmaking. "Taking costs out of the procurement chain will happen neither singly with an open-market solution nor with a closed, trading-partners-only solution," says Mark Teflian, chief technology officer and vice president of engineering for Nets Inc., parent company of Industry.net, the grand old man in this sprightly young business. "We stand at the intersection of open and private markets."

So yes, companies come to Industry.net when they're looking for products they've never purchased or for new suppliers when old ones go away. But the service also helps them get the most out of established supplier relationships. Teflian gives the example of an engineer working in an automobile plant who suddenly finds he needs a certain type of fuse the company doesn't usually buy. "Normally there would be a blanket work order covering the whole project saying, 'This is everything you need to build a Ford Escort,'" says Teflian. "So if you need this fuse, you'd have to submit a requisition for a new blanket order and then, once the purchase order is cut, go out and buy the fuses. The process costs five or six times what the fuses cost."

A better solution, says Teflian, is for the automobile company to establish an integrated relationship with an electronics supplier and for that supplier to maintain an electronic catalog of all parts on the Industry.net site. The engineer could then go in and buy the fuses, even if he'd never bought them from that company before. Because the two companies have established spending authorization rules in advance, the engineer can do the deal solo and still take advantage of any prenegotiated discounts between buyer and seller. "So there's the case that buyers and sellers don't know each other," says Teflian, "but there's also the case where the buyer knows the seller and wants to extend that relationship."

*–L. Buchanan*

route required little gray-cell expenditure: "We didn't want to pay [value-added network] charges, and every one of our requisitioners already had access to a huge Internet infrastructure," he says.

The GSA Advantage site lists more than 220,000 products and is doing $1 million a month in sales.

The goal was to present all of MIT's thousands of buyers—faculty, teaching assistants, graduate students and staff—with customized catalogs containing prenegotiated product selections and prices. Office Depot Inc.'s catalog, for example, would offer MIT's educational discount but wouldn't include computers and furniture, which the university purchases elsewhere.

For the pilot, Roden's team partnered with American Express Co., Office Depot and VWR Scientific Products, a large distributor of scientific supplies. The companies created MIT-specific catalogs on their own Web sites, with built-in spending authorizations determined by the university. MIT buyers access the catalogs with a password, place their selections in an electronic shopping basket and pay using an American Express corporate purchasing card. Items are delivered the next day.

MIT officially rolled out the system, called ECat, in March. Diane Shea, the university's director of purchasing, says MIT eventually will offer other products and services online, including temporary help. "We have a partnership with Olsten Staffing Services, and we're looking to [get them on the system] as well, maybe with people's profiles and résumés," Shea says.

While the Web can do much to simplify trade relationships, what happens within organizations is at least as complex as what happens between them. Computer maker Unisys Corp., for example, turned to the intranet when its dispersed and disorganized purchasing processes threatened to sink opportunities to leverage corporatewide discounts.

## FINDING IT ONLINE

**Alan Raedels' home page of procurement links**
*www.sba.pdx.edu/faculty/alanra/homepage.htm*

**American Management Systems Inc.**
*www.amsinc.com*

**GE Trading Process Network**
*tpn.geis.com*

**Giga Information Group**
*www.gigasd.com*

**GSA Federal Supply Service**
*www.fss.gsa.gov*

**IBM Corp.**
*www.ibm.com*

**Lewan & Associates Inc.**
*www.lewan.com*

**MicroAge Inc.**
*www.microage.com*

**MIT**
*web.mit.edu*

**MIT's ECat Project**
*web.mit.edu/ecat/project.html*

**National Association of Purchasing Management**
*www.napm.org*

**Nets Inc./Industry.net**
*www.industry.net*

**Stanford University**
*www.stanford.edu*

**SupplyWorks Inc.**
*www.supplyworks.com*

**Unisys Corp.**
*www.unisys.com*

**XLNT Designs Inc.**
*www.xlnt.com*

Back in 1995, Unisys had approximately 40 procurement groups operating worldwide, and "nobody knew what anybody else was doing," says Chuck Stemler, the company's director of financial planning for global procurement. "We might have five or six different locations having contracts with the same company—sometimes for the very same commodity—but all on different terms."

Recognizing the need to consolidate contracts and keep them that way, Unisys embarked on an ambitious information-gathering and intranet-development initiative. "The goal was to open every drawer and shake every file and find out who had what contracts and get all that information into a central database accessible via the Web," says Stemler. "Now if you need a certain commodity, you can go in there and find out, 'Oh, our California operation already has a contract for that; I'll piggyback on them rather than start all over again.'"

Unisys's system, dubbed the Global Procurement Network, and now an essential part of the company's intranet, also brings the buying process closer to the rest of the company. For starters, Stemler's group has posted on the network a customized catalog from office supply vendor Corporate Express Inc., and it is urging employees to place orders via e-mail. There is also an online guide for end users who need to buy something but haven't a clue how to go about it. "They can key in what they want and find out who the contact is for that commodity and all the steps they have to go through and the forms they have to fill out," he says. "It's being used extensively."

Educating end users is also a goal of GSA Advantage, the General Services Administration's ordering system, which allows federal agencies to buy everything—be it microcomputers or storm windows—through a Web site. The site lists more than 220,000 products and is doing $1 million a month in sales, according to Teresa Sorrenti, director of the Acquisitions Operations and Electronic Commerce Center of the GSA's Federal Supply Service. GSA Advantage helps government purchasers buy wisely without having to master the umpteen different programs available to them,

Sorrenti explains. "Some agencies know that they can order an item from a vendor but not that we also keep it in stock for immediate needs. Or they might know that we keep it in stock but not that they can do overnight ordering at a slightly higher price. This way, [requisitioners] can easily see all their options and make a choice based on price and delivery."

The ability to make "smart buys" is also enhanced by a company's understanding of its own procurement behavior, says Ray Blair, a director of market development at IBM Corp. The IBM World Purchasing service, which allows buying organizations to host browser-accessible supplier catalogs on the Internet, an intranet or on Lotus Notes, also lets managers view transaction information and analyze purchasing trends. "Now I'm going to be sitting at my terminal and instead of looking at a PO to fill out or track, I'm going to be looking at what we're actually buying," says Blair. "Now I can make decisions about doing it a better way."

Using an early version of the product, purchasing managers at Lotus Development Corp. determined that requisitioners were unnecessarily buying custom-built—as opposed to preconfigured—PCs at an additional cost of $600 a pop.

"Before, they had no way of knowing what people were buying unless they polled them, collected all the data and punched the data into some system," says Blair. "Once they saw the problem, they went back to the end-user executives and said, 'Hey, why are you allowing your people to buy custom-built PCs?'"

THE IBM SYSTEM, like a number of other products coming on the market,

## BUYERS GUIDE

**What follows is a smattering of tools for Web-based business buying. Products that enable Internet EDI are not included.**

| | | | |
|---|---|---|---|
| ACTRA BUSINESS SYSTEMS LLC | *www.actracorp.com* | **ORDEREXPERT SYSTEM** | Electronic catalog-based order management system for procurement over the Internet. |
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| ELCOM SYSTEMS INC. | *www.elcom.com* | **PECOS** | Internet tools for comparing and selecting products, real-time ordering and status checking. |
| FISHER SCIENTIFIC INTERNATIONAL INC./ FISHER TECHNOLOGY GROUP | *www.fisher1.com* | **SUPPLYLINK** | Electronic sourcing and procurement system that can run on a Web server. Fisher also operates the ProcureNet electronic mall (*www.procurenet.com*) for maintenance, repair and operations (MRO) products, and laboratory and office supplies purchasing. |
| GE INFORMATION SERVICES | *www.geis.com* | **TRADING PROCESS NETWORK** | Suite of Internet purchasing tools, including TPNPost, for electronic RFP distribution and bid receipt (*tpn.geis.com*). GEIS recently joined forces with the Thomas Publishing Co., publisher of the Thomas Register of American Manufacturers, to create TPN Register, which will allow end-to-end procurement of industrial materials. |
| IBM WORLD PURCHASING | *www.internet.ibm.com/commercepoint/html3/purchasing/* | **IBM WORLD PURCHASING** | Service that provides end users with access to customized supplier catalogs via a Web browser. |
| INTELISYS ELECTRONIC COMMERCE LLC | *www.intelysis.net* | **INTELIPRO** | Application that leverages the Internet and intranets for corporate purchasing of nonproduction goods. Beta is scheduled for release in May. |
| MICROAGE INC. | *www.microage.com* | **ECADVANTAGE** | A system of Internet-based ordering, quoting and configuration tools. |
| SPACEWORKS INC. | *www.spaceworks.com* | **ORDERMANAGER** | Provides an Internet-based ordering, supply and fulfillment channel from customers to a wholesaler's back-office system. |
| TRADE'EX ELECTRONIC COMMERCE SYSTEMS INC. | *www.tradeex.com* | **TRADE'EX PROCUREMENT** | Software that establishes a centralized, secure electronic procurement system over the Internet. |

puts a Web interface on the purchasing process without moving transactions to the Internet itself. "I don't think there's a confidence level yet among a lot of our customers that they would want to have this information on the Internet," says Blair. "But it's bound to happen."

Thayer Stewart, vice president of business development in American Express's corporate services division, agrees that simply tweaking the old EDI model does not a revolution make. "A lot of companies when they get their intranet say, 'Oh, great, now we can just give people a Web interface to [supplier data],'" Stewart says. "But the data itself is still sitting on their network, and you have to manage it, and there could be 10 million orders from hundreds of trading partners. And you're still going to have all those EDI communications coming through your intranet's back door."

Stewart says he would prefer to see a system in which suppliers post private views of customer catalogs on their own sites and support end-to-end transactions for all comers, thus achieving the best of both private and public networks. But that will require standards for everything from prefilling profile information to validating accounting codes—something a consortium of major companies called the Internet Purchasing Roundtable is pursuing.

Roden, who along with Stewart, works with the consortium, says it's really only the lack of an infrastructure that is preventing Internet-based business procurement from taking off. "It's time for companies to start looking at their relationships with suppliers as opposed to figuring out how to move real paper—or electronic variants of paper—around," he says. "We need to take off the green eye shades and think about purchasing as a strategic resource." WM

Unisys turned to the intranet when its dispersed and disorganized purchasing processes threatened to sink opportunities to leverage corporatewide discounts.

*Executive Editor Leigh Buchanan can be reached at* buchanan@cio.com.

# a small price to pay

**Corporate buyers don't spend a lot of time on the Net looking for deals. That doesn't mean they never find them.**

The Web's potential as a treasure-trove for bargain hunters matters far more to consumers than to business purchasers. "Price is probably the least important consideration" for corporate procurement managers, says Alan Raedels, professor of business administration at Portland State University. "Quality, delivery, service, technology—all of those are more important than price."

Nevertheless, the Internet can reassure companies that they're not spending more than they absolutely have to. Jim Arnold, executive vice president of computer reseller Lewan & Associates Inc., uses ECadvantage, an Internet-based ordering system from MicroAge Inc., to compare up-to-the-minute prices from the half-dozen product aggregators with whom he does business. "You can hold them honest because in some cases there are significant differences in costs, and this helps identify them," Arnold says. "Under the old model, we'd go to our primary aggregator, and if they had [the desired product] in stock, we bought it. But then we'd find out that we weren't competitive, because someone else in the channel was offering it for 5 percent less. This way, we can find out about promotions easily and be sure that we're putting the most competitive price out on the street."

In addition, suppliers who can check out competitors' prices online may feel compelled to edge down their own, says Teresa Sorrenti, director of the Acquisitions Operations and Electronic Commerce Center of the General Services Administration's Federal Supply Service. "Vendors look at their competitors [on the agency's GSA Advantage service], and if they see that someone is beating their price, they can submit a price change to us immediately," says Sorrenti. "They stay competitive, and the government benefits."

The Net does present occasional opportunities for casual surfers to seize the day. One such opportunity occurred recently when a Stanford University employee stumbled across an online auction of Hewlett-Packard printers. The printers' list price was $5,000; Stanford, with an educational discount, could expect to pay at least $3,000; and the highest bid so far was $1,500. Excited, the employee called Charlie Channel, then an analyst in the university's procurement department and now a program manager in Sun Microsystems Inc.'s Supply Management Programs Group, to find out how to bid for a printer on Stanford's behalf.

But Channel had to tell him it was no-go: Stanford prohibits the use of its purchasing cards over the Web. "That's an instance where somebody saw an opportunity to save money and to get something that they really wanted," says Channel.

Channel says he would have loved to see Stanford adopt a more Web-friendly procurement strategy but that the powers that be were too nervous about security. "I talked to some of the procurement managers, and I said, 'You guys have to think about this because this type of thing is going to happen. And it's really hard to justify not saving $2,000 for the sake of control when the risks aren't that great.'" *–L. Buchanan*

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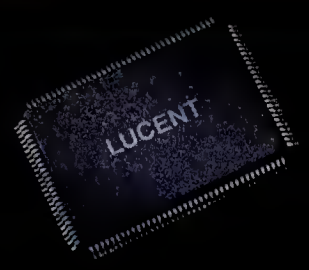


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# To Know Me Is To Pay Me

**Author John Hagel describes a future in which consumers provide companies with all the personal information they could ever want—for a price**

BY SCOTT KIRSNER

PHOTOGRAPHY BY KENT HANSON

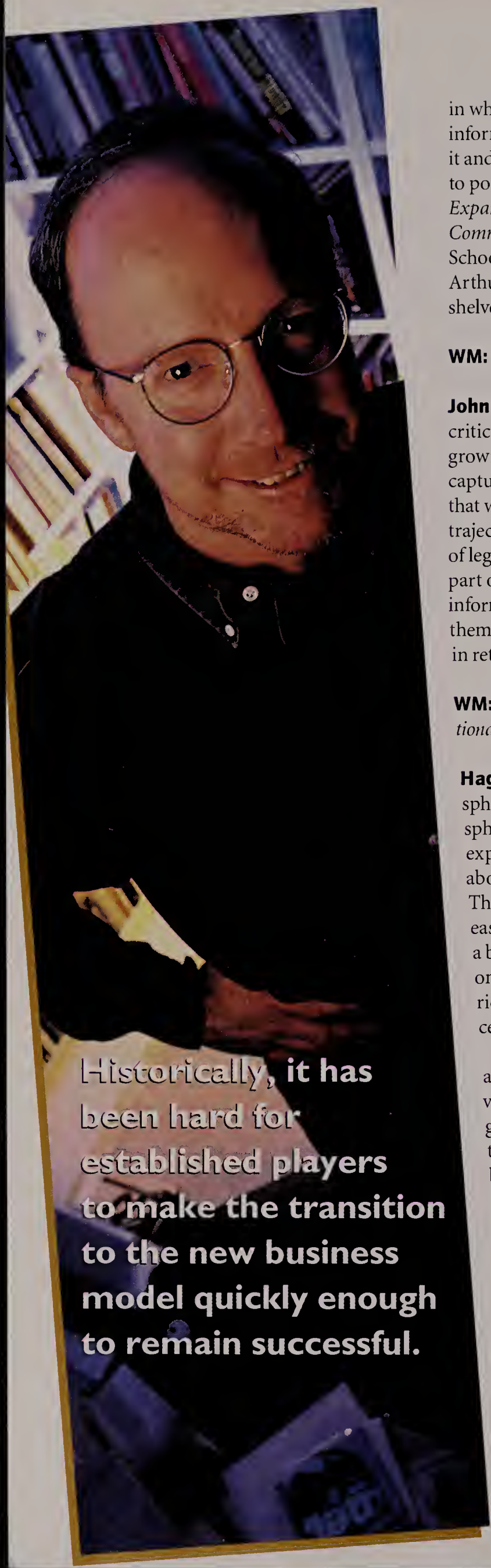
REMEMBER YOUR LAST VISIT TO RADIO SHACK? As you approached the counter with a pack of double-A batteries in hand, the clerk tapped a few keys on his terminal and asked for the last four digits of your telephone number.

To avoid a confrontation, you complied, and if your name wasn't already in the Radio Shack system, you were requested to provide a raft of other personal data: street address, ZIP code, home phone number, office phone number and so on. All because you wanted $2 worth of batteries.

That experience, says consultant John Hagel III of McKinsey & Co., is a prime example of information abuse. And if you think it's a problem at Radio Shack, consider the potential for such interrogation on the Web. Web sites routinely hammer us for information, but offer nothing in return. We fill out lengthy demographic surveys, answer questions about our buying habits, enter our ZIP codes, provide insight about potential future purchases and get back zilch. Nada.

But perhaps, says Hagel, all of that will change. In a provocative article published in the January-February 1997 *Harvard Business Review*, Hagel and his co-author, Harvard Business School professor Jeffrey Rayport, suggest that such manhandling of consumers may be halted by consumers themselves once they realize the information they hand over freely is, in fact, an asset they should be paid for. Hagel points out that there's nothing to stop people—aided by software packages that track personal finances and other tools—from compiling their own demographic and purchasing profiles and selling the information to companies that want to sell to them. Rather than dealing with each company individually, however, consumers will likely go through a new type of middleman, whom the authors call an "infomediary." Infomediaries, says Hagel, will act as agents for consumers, helping them get the best compensation—in the form of discounts, upgrades or gifts—for the information they provide.

As a principal in McKinsey's Palo Alto, Calif., office, Hagel travels the world to help clients understand concepts such as this model of the emerging information economy, one



Historically, it has been hard for established players to make the transition to the new business model quickly enough to remain successful.

in which the consumer controls the information, the infomediary brokers it and the company that wants it has to pony up. His new book, *Net Gain: Expanding Markets Through Virtual Communities* (Harvard Business School Press, 1997), written with Arthur Armstrong, hit bookstore shelves in March.

**WM:** *What is an infomediary?*

**John Hagel:** An infomediary is a critical player in terms of resolving the growing conflict between information capture and privacy concerns. I think that we're headed in a long-term trajectory toward a significant outburst of legitimate privacy concerns on the part of people who see more and more information being captured about them and less and less value delivered in return.

**WM:** *Will that happen in both the traditional sphere and the electronic sphere?*

**Hagel:** Particularly in the electronic sphere because in the traditional sphere, it's still pretty difficult and expensive to capture information about consumers and what they do. The Internet makes it dramatically easier and lowers the cost. Almost as a byproduct of the activity of people on the network, you're capturing a rich profile. So it magnifies the concern to another level of urgency.

The issue, I think, is that people are seeing not just limited positive value to all this information being gathered but also increasing negative value: credit card applications being turned down, health insurance applications being turned down, all because of information profiles on those people.

The infomediary notion is the realization that we now have the potential for the consumer to capture information about himself and then to look to some third party who would act as an agent in maximizing the value of that information. An infomediary would be essentially a custodian for the information being captured about these individuals. And then, based on the privacy preferences of a particular individual, the infomediary would broker that information.

In some cases, the person may say, "I want complete privacy; I don't want anyone to know this information," in which case the infomediary keeps it private. But most people are going to make some kind of tradeoff. They'll say, "In return for certain kinds of value, I'm prepared to give out this information." The infomediary negotiates on behalf of the customer with vendors that are able to deliver that value.

A trivial example, but one that's relatively well established in the physical space, is the frequent flier club. In return for giving up information about my flights, I get significant value from the airline in the form of free flights, upgrades or whatever.

**WM:** *One of the examples that you bring up in* Net Gain *is the online bookstore Amazon.com, where you voluntarily give them information about authors you're interested in, and then they'll send you a message when those authors write a new book.*

**Hagel:** Exactly. And I think the trick is being responsible about that information. As soon as Amazon.com starts doing mass mailings or less-targeted mailings responding to that customer's needs, it will find it harder to capture that information in the future.

**WM:** *So there's a fine line in how you gather and use information on the Web.*

**Hagel:** Absolutely. The responsible essence of advertising has always been that everybody places value on information that's relevant to them about products and services they need. If the information can be packaged in a way that's timely and responsive to a person's needs, it's extremely welcome. Where we run into problems is when the advertising becomes more of a blitz approach, where it's undifferentiated in terms of reaching people.

**WM:** *Then you have problems like AOL's junk e-mail lawsuit.*

**Hagel:** That's a classic example of the old model being applied to the new technology platform. People were saying, "Oh, now we have a much lower-cost way of doing junk mail! Great!"

**WM:** *Are there any infomediaries on the Internet right now?*

**Hagel:** There's no one in my mind who is explicitly and systematically positioning themselves for the opportunity. In the *Harvard Business Review* article, we looked at the potential for a company like Intuit, which captures a lot of information about people anyway, to position itself in this infomediary role. There are some newer players, like the Firefly Network, that have the potential and in some of their public announcements, have suggested they may head in this direction. But in our minds, this is an opportunity that hasn't been exploited.

I think one of the challenges and one of the reasons it hasn't been fully exploited is that, on the one hand, you need extraordinary trust from your customer, and, on the other hand, most of the players that have built up substantial trust today are selling products and services, so they'd be viewed as having a bias in managing information on the part of the customer.

The small startups, which have the potential to do this "green field," have to build trust very quickly. On the other hand, the companies that already have the trust have a hard time exploiting it because of the perceived bias.

**WM:** *It seems like the big companies are asleep at the wheel. Right now, my bank gets a lot of information about me for free that it doesn't use very well. Are banks going to be able to make the shift to a world where they have to pay me or give me some other benefit for that information, or is some startup going to eat their lunch?*

**Hagel:** That is the big challenge. Historically, whenever you look at major transitions in business, it has been hard for established players to make the transition to the new business model quickly enough to remain successful. Yet it can be done, and I would argue that they should be trying to do it. What's going to make this very real is the emergence of those new game players that start without the baggage of the past and are aggressively exploiting those new business models.

**WM:** *Is being an infomediary going to be a profitable business? Is it something a company would want to do as a core business, or will it just be an ancillary one?*

**Hagel:** I think it has the potential to be an enormously attractive business on a standalone basis. If you think about how much people spend today in the United States on advertising to try to reach consumers, it's something on the order of $140 billion. And that's in an environment where advertising is widely recognized to be enormously inefficient. Imagine a world where we could be not only convinced of the efficiency [of advertising] but also could see it in action on a transaction-specific basis. I think people would spend a lot more to reach customers in that kind of environment.

**WM:** *If a company wants to reach me, will it always need to go through an infomediary? Or if it can somehow deliver value to me directly, will it be able to deal with me without involving the infomediary?*

**Hagel:** I think that is the challenge for many vendors—to quickly establish that trust-based relationship with their customers so that customers are willing to forgo the infomediary function.

**WM:** *But once the infomediaries are in place, they become harder to circumvent.*

**Hagel:** That's the issue. As long as most vendors are not able to provide that clear value in return, infomediaries will emerge. And once they do emerge, there's tremendous value in aggregating that information.

Take travel. There's some value to American Airlines knowing who travels frequently on American Airlines. The problem is that United Airlines' frequent fliers are invisible to American. An infomediary will help make that information visible. So if I'm American Airlines, I can find out who is flying on United and Delta by enlisting the services of an infomediary and seeing who is a frequent flier in general, not just those who are favoring my airline. That aggregation of information is where infomediaries will be valuable.

**WM:** *It actually makes a real person visible to them rather than just some fraction of a person.*

**Hagel:** Exactly.

**WM:** *What sort of time frame do you envision for this shift, until we get to the point where I'm controlling all the information about myself in a comprehensive way using an infomediary?*

**Hagel:** There are a number of issues to overcome. For one thing, the technology to allow this sort of information capture on the customer side, as opposed to the vendor side, is just starting to become available. That [actually will be resolved fairly quickly]—on the order of a year or two.

The bigger issues are going to be the building of trust and the aggregation of customers. Until an infomediary has a reasonably large customer base, it's going to be hard for it to truly exploit the value of the information that it is cap-

turing. [Those two things] will take a good three to five years to play out.

**WM:** *How do you see a company doing that? Does it approach potential customers and say, "Hey, give us your information and someday you'll get something good in return?"*

**Hagel:** Well, one approach to that is building a virtual community—from the outset, providing resources that are valuable to the member. Maybe the community provides some kind of rating service of resources that are already out there on the Internet. That's all part of starting to build trust on the part of the member, and, in the process, I'm starting to capture some early information so that I can be more thoughtful about what part of my directory that member accesses, how frequently he or she accesses certain topics and what sites he or she actually winds up clicking out to.

**WM:** *Does all that happen with the permission of the member?*

**Hagel:** I think it's essential for anybody who is trying to position themselves in this infomediary role to be explicit from the outset with their customers—to have, in effect, an information contract with the customer—as to what kind of information they're going to be capturing and what uses will be made of that information. And, of course, they must always offer the opportunity for the customer to opt out.

**WM:** *We talked before about the fraction of my life that American Airlines doesn't see because I'm flying on Delta or United. What about the parts of my life that an online infomediary doesn't see? For example, I've purchased two books online from Amazon.com, but I've purchased hundreds of books in the real world from Borders and Barnes & Noble. How do infomediaries merge the online and offline information?*

**Hagel:** That's clearly the next stage that needs to be thought through. There are some interesting options. Just to give one example that's current, Intuit has a credit card with which, as you make your transactions, you can automatically download the information into your Quicken database. It's an interesting way to extend from the virtual world into the physical world and, in the process, deliver significant value to the customer. There's a huge value because, as anybody who's used a Quicken package [can tell you], manually entering all those credit card transactions is a real time-consumer. Now, Intuit is getting a picture of a broader range of transactions that occur in physical space as well as online.

The other option is to create links between online infomediaries and the use of smart cards in real-world retail environments. [Smart cards can be used] as an information capture vehicle that ties back into the integrated database that's being accumulated online.

**WM:** *As more and more businesses migrate online, how important is this concept of delivering value in exchange for customer information, either directly or through an infomediary?*

**Hagel:** Without trying to be melodramatic about it, it's a life-or-death situation. The problem is that infomediaries aren't going to spring up right away, so it's going to be very hard for most companies to make the kind of dramatic shift that's called for in their business focus and their skill development. Yet, at some point over the next decade, that becomes something that's so far developed that trying to catch up will be increasingly difficult, if not futile.

That's the dilemma. This isn't going to happen overnight, so on the one hand, you have the benefit of time to make this shift. But on the other, you have the curse of time because you can always rationalize that it hasn't happened yet, so let's just continue along the current path. WM

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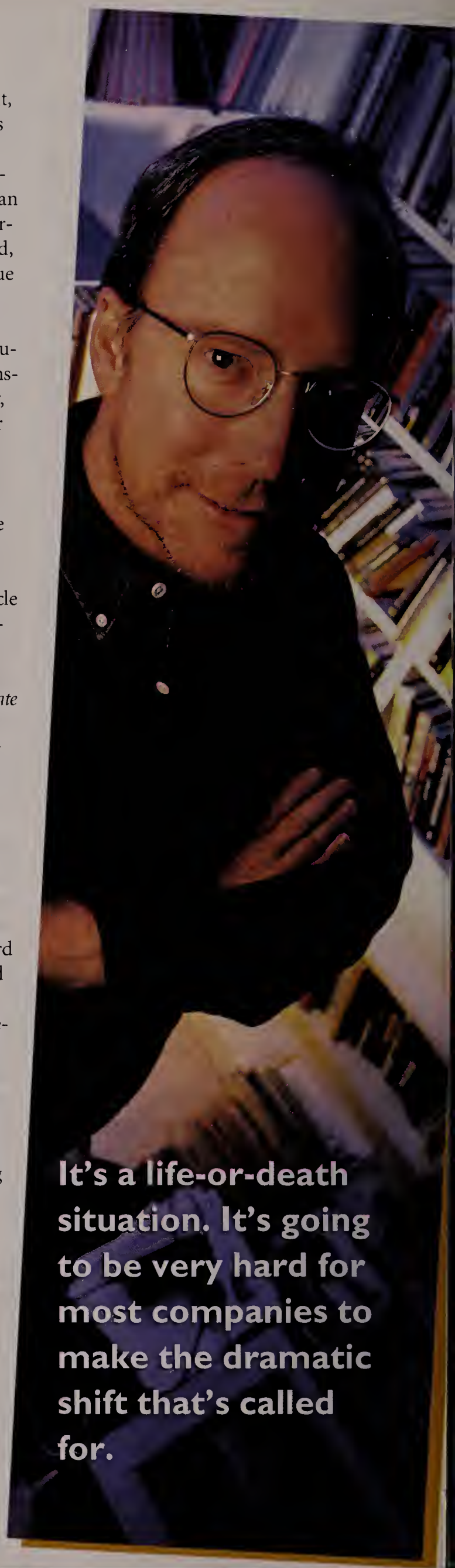
*Scott Kirsner is a Boston-based writer. He can be reached at* kirsner@worldnet.att.net.



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A WEB TEAM'S TECHNOLOGISTS ARE NEITHER KINGS NOR PAWNS. RATHER, THEY ARE KEY PLAYERS WHOSE JOB IS TO EXPLAIN THE POSSIBLE AND THEN MAKE IT REALITY. **BY MATTHEW CUTLER**

# Tool Sharks

**Many people think of the webmaster function as a** hierarchy, with technologists residing at the very top or the very bottom. Those who exalt technology as the be-all and end-all of the Internet expect Web efforts to be driven by networking aces and Java jocks; those who dismiss it as plumbing view technologists as lackeys carrying out the will of business strategists and content creators.

In the real world, neither extreme works very well.

When the Web team's emphasis is—as it should be—on fielding a successful site, technologists are recognized as peers of the other players. What makes Web efforts distinctive is that technology more often creates than limits new opportunities. Thus, technologists sit at the table with strategists, evangelists, content creators, designers, domain experts and information architects, explaining not only technical advances but also the implications of those advances for the team's project. "Let me tell you about this new application called Castanet," they say, "and then let me show you how we can improve our Web site with it!"

In matters besides status, the technologist's role on the Web team is evolving as rapidly as the technology itself. To simplify matters, the Webmasters' Guild has sometimes divided technology into three areas (though many other breakdowns are possible): hardware, software and networking.

Hardware on the Web usually means the server platform, which is the traditional domain of IS. Although many webmaster teams do borrow hardware specialists from the corporate systems group, external Web servers often operate under different conditions than do traditional servers. For example, your Web server will likely see widely fluctuating traffic loads and may be subject to extreme spikes in usage depending on how the site is promoted. Also, the Web server acts as a focal point for thousands of users around the world as well as for numerous content creators inside your company. Therefore, be sure to consider the "nonstandard" factors inherent in Web servers when choosing a hardware platform.

*Part 7*

**TECHNOLOGY**

**This is the last in a seven-part series of articles in which Webmasters' Guild President Matthew Cutler discusses the tasks and responsibilities of the webmaster function.**

Significantly, one thing that doesn't count much in choosing a server platform is the processor. Unless your site is dynamically generated or contains an inordinate amount of CGI processing, raw processor power will not dramatically affect overall performance. Physical memory (RAM) space and I/O capacity are probably far more important, as is the platform's ability to work smoothly with your production environment and end-user tools.

Software, obviously, is a far meatier topic, as new products proliferate at Pentium Pro-level speeds. Peter Cooney, assistant managing editor for systems and webmaster at *The Montreal Gazette*, describes the situation this way: "You'll train your staff, and tomorrow [the technology] will change. By tomorrow, I don't mean a year, six months or 30 days. I mean tomorrow—24 hours. That is the reality you face."

For that reason, the software experts on your team must evince an interest in and curiosity about emerging technology. Those who complain about too much new

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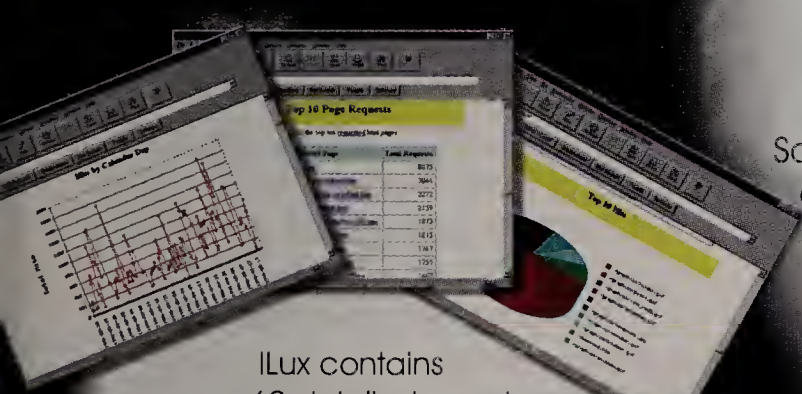

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stuff coming at them every day will quickly be buried.

Not all software categories are equally complex, of course. Basic server software, in particular, is rapidly coming down to a choice between the product of two vendors or different versions of shareware. But as companies increasingly connect their Web sites to back-end systems, the need to manage middleware that acts as a liaison among databases, directory services, transaction systems and other applications becomes pressing. In addition, companies hoping to lure more visitors and keep them on-site longer are fielding a variety of server-based applications, such as real-time chat and threaded discussion groups.

Client-side software is even more diverse. One problem the webmaster team will find especially challenging is creating and maintaining the production environment. Ambitious sites sometimes involve hundreds of people contributing content almost minute by minute.

At the same time they must handle such tasks as revision control, content testing and templating. To date, the production-environment tool category is one of the weaker on the market, so it is a good idea, where possible, to put someone with document-management responsibility in charge (see "Authors, Authors Everywhere," *WebMaster*, January 1997).

CHANCES ARE, you already have networking experts in your organization. But despite their expertise, they'll probably face a learning curve before they can assume those duties for the webmaster team. Tackling the issues involved in setting up a 50-node LAN is often not sufficient preparation for connecting to the Internet, a public network that is both highly insecure and highly heterogeneous. And it's very important that you get this piece right: Your hardware platforms and back-end systems may be top-drawer, but if your customers have a lousy experience connecting to them, their impression of your system will be a lousy one.

Here, too, security rears its ugly head. Security is like your sewage system: If everything is running smoothly, no one gets any applause, but the minute something fails, it becomes a very big problem. Your networking expert must carefully consider your company's security requirements and then make decisions on things such as network topology and access control.

Security clearly is so important that it's a good candidate for outsourcing. Even if you decide to do the design and implementation in-house, it is wise to have your network's security analyzed by an expert who can pinpoint potential weaknesses. Software vendors are also beginning to offer products that help companies to identify vulnerabilities.

SO WHAT CHARACTERISTICS are most desirable in Web team technologists? Because skill sets become outmoded so quickly, the ability to master new things is more important than proficiency in any particular technology. (That's why the Webmasters' Guild approaches the topic of certification very cautiously. It remains one of the most controversial issues among our membership.) In addition, Web technologists should be willing to assume responsibilities that extend beyond the normal scope of their jobs. Perhaps the best advice is to follow the practice of Microsoft Corp.: Look for smart people with open minds who can be taught to do anything as opposed to a thoroughbred that knows only how to run around an oval racetrack.

We chose to address technology last in this series of articles to make a point. Mention the word "webmaster," and, for many, it conjures up the image of someone who can download the Apache Web server, write a few application programming interface extensions, and get it up and running in his or her sleep.

The reality, as we hope these columns have conveyed, is that Web environments are created by multiple people with multiple skill sets, backgrounds and outlooks. The roles and responsibilities of the webmaster team are just as fluid and exciting as the Web's underlying technology, making the experience of serving on such a team both rewarding and exhilarating. WM

**"You'll train your staff, and tomorrow the technology will change. By tomorrow, I don't mean a year, six months or 30 days. I mean tomorrow—24 hours."**
**—Peter Cooney**

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*Matthew Cutler is president of The Webmasters' Guild Inc.* (www.webmaster.org), *the country's first professional organization for webmasters. The guild is a nonprofit organization dedicated to educating, promoting and unifying the global webmaster community. Cutler is also a founder and director of Net.Genesis Corp.* (www.netgen.com), *a provider of Web performance and usage analysis software. He can be reached at* mcutler@webmaster.org *or* mcutler@netgen.com.


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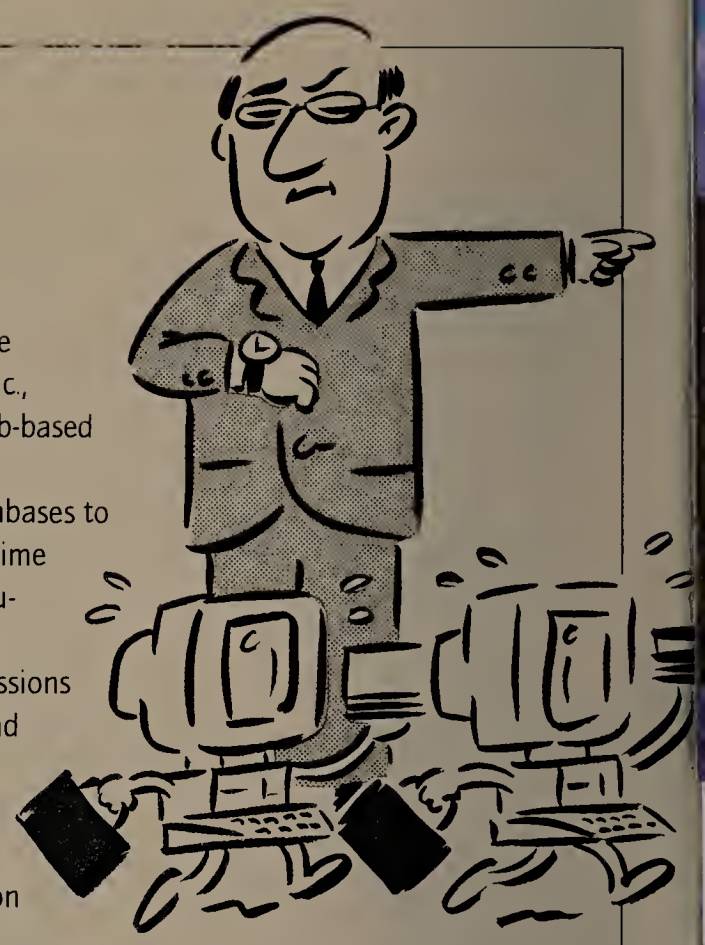
ILLUSTRATIONS BY JOHN CLARKE

## TIME AND MONEY



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*Continued on Page 63*



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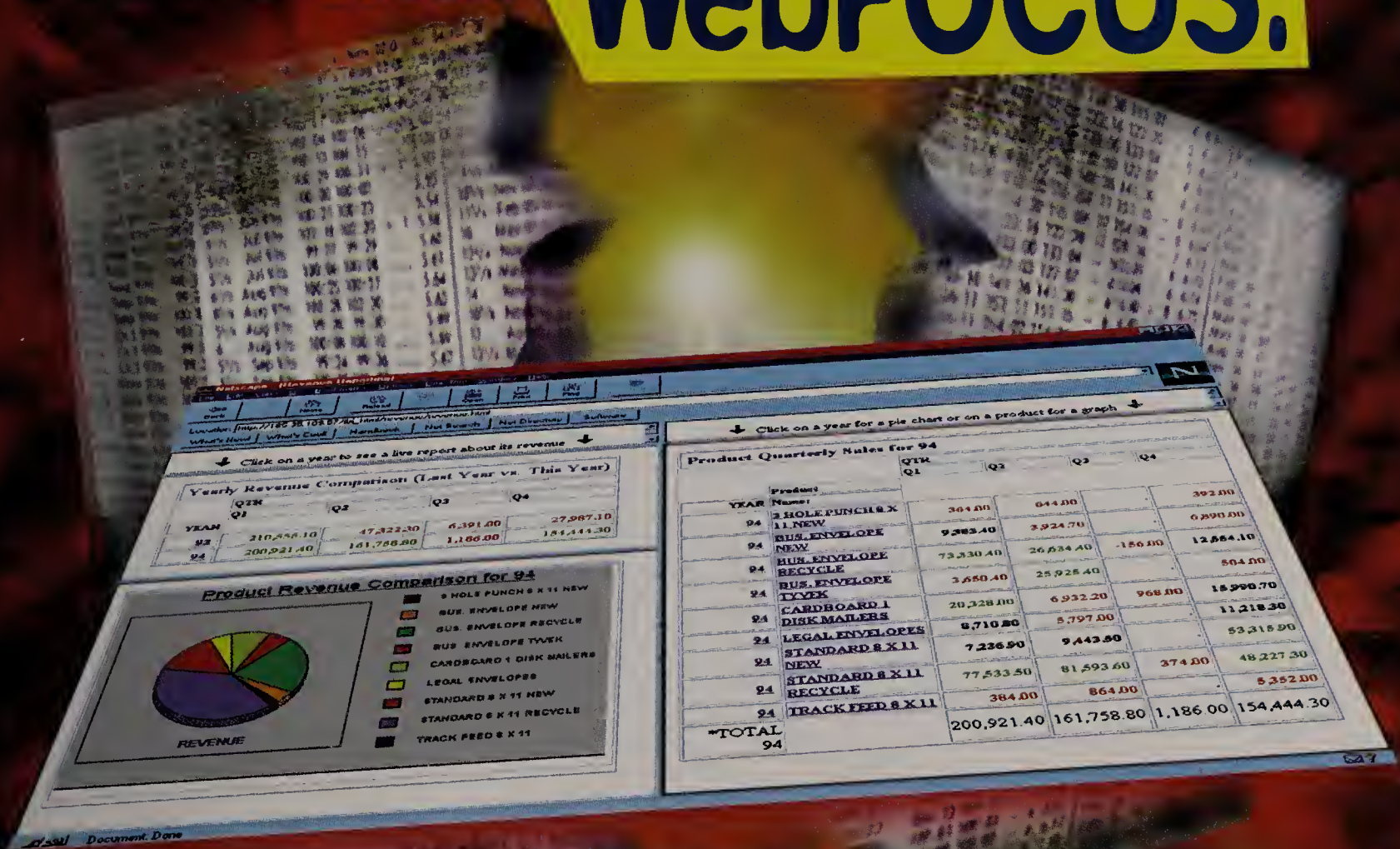


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